A Field Guide to Forest Ecosystems of Northeastern Ontario

2nd Edition
May 2000

by K.C. Taylor
R.W. Arnup
B.G. Merchant
W.J. Parton
J. Nieppola

Illustrations by
Shayna LaBelle-Beadman
Inside Cover Illustration by
Kim Taylor
Publication Design by
Wendy Copps

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Quick Start Page

Quick Start

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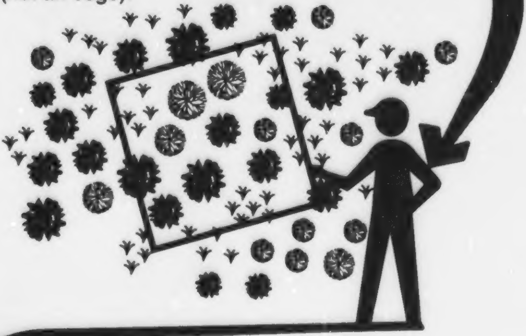
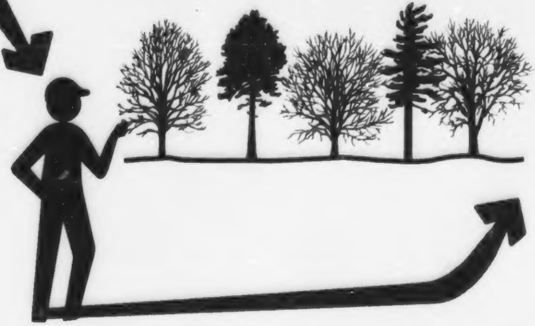
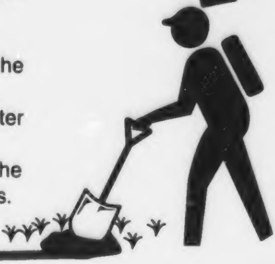


2. Determine if you have sugar maple, red maple, yellow birch, white pine or red pine in the main canopy. If you do, go directly to step 4. If not, go to step 3.



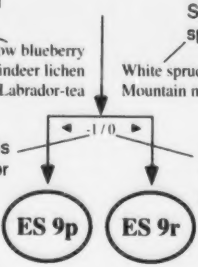
Refer to page A 2 and A 3 for more details.



3. Dig a soil pit or use a soil auger to determine
   - depth to bedrock
   - dominant soil texture in the first 60 cm
   - thickness of organic matter and Ah

   This will bring you to one of the eight major ecosite groupings.

4. Determine which indicator plants you have and use them to go through the ecosite key and determine which of the 29 ecosites you have.


Early low blueberry
Reindeer lichen
Labrador-tea
White spruce
Mountain maple
-1 / 0
ES 9p
ES 9r

Score -1 for each species found

Score +1 for each species found

If total score is this number or less go left

If total score is this number or greater go right

5. Check the ecosite you determined with the descriptions in Section C.

Refer to page A 2 and A 3 for more details.

Authors and Acknowledgments

The authors of this field guide have been working as a project team since 1994 when the collection of data for the review, expansion, re-analysis and revision of the Forest Ecosystem Classification for Northeastern Ontario began. The authors are:

Kimberly Taylor	Northeast Science & Technology, MNR, South Porcupine
Rob Arnup	ESG International Inc., Timmins
Barb Merchant	B.G. Merchant Consulting, Minden
John Parton	Northeast Science & Technology, MNR, South Porcupine
Jari Nieppola	Forest ecology consultant, Toronto

Illustrated by Shayna LaBelle-Beadman, LaBelle-Beadman Consulting, Cochrane

Publication design by Wendy Copps, Blue Heron Graphics, Timmins

Please direct inquires to the Terrestrial Ecologist, Northeast Science & Technology, Hwy 101 East, PO. Bag 3020, South Porcupine P0N 1H0.

Acknowledgments

This updated and enhanced edition of A Field Guide to Forest Ecosystems of Northeastern Ontario builds upon the work done in the previous version of this guide. The authors would like to thank all of those individuals who have been involved with the program over the years for their skills and commitment.

We would also like to thank:

- Mary Ellen Stoll, Northeast Science & Technology (NEST) Coordinator, for her continued championing of the project over the years.
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- The authors would also like to acknowledge their debt to the pioneering work of Geoffrey Pierpoint and R. Keith Jones in the Ontario FEC program.

During the revision of this guide, NEST lost an enthusiastic supporter of the FEC system with the passing of Neil Maurer. Neil was always very giving of both his technical input and teaching of FEC in the field. We would like to acknowledge his contribution.

Most of the material on soil recognition and description is excerpted from the Field Manual for Describing Soils in Ontario, 4th Edition, published by the Ontario Centre for Soil Resource Evaluation, Guelph Agriculture Centre, and the University of Guelph.

The initial funding for this project was provided by the Northern Ontario Development Agreement (NODA). In recent years the project has been supported by the Ministry of Natural Resources Ecological Land Classification (ELC) program and the Sustainable Forestry Initiative (SFI).

The Authors
May 2000

About This Guide

Understanding boreal forest plant communities with their hundreds of species and multiple environmental gradients, is a very complex task. Statistical analyses help in creating classification systems by reducing complexity and revealing understandable patterns.

Classification units, at various scales, are the building blocks that people use to understand the forest. The Forest Ecosystem Classification for Northeastern Ontario, at its most fundamental level, answers the question "what is it?" when people are discussing forest communities. Through understanding what a community is, we have a framework for determining the effects of our management activities on it.

This second edition of "A Field Guide to Forest Ecosystems of Northeastern Ontario" (NE-FEC) allows any mature forest ecosystem to be allocated to one of 29 ecosites, 28 vegetation types and 23 soil types. The ecosites, vegetation types and soil types provide a useful basis for developing forest management interpretations. Examples of some possible interpretations are included in this guide.

The classification is based on the analysis of 1,203 sample sites from across MNR's Northeast Region. We used multivariate data analysis techniques on the quantitative soil and vegetation information collected at these sites, along with expert knowledge, to build this classification system. A brief summary of the analytical methodology is included in Appendices B and C.

The classification system is based on data from northeastern Ontario. For applications near the western boundary of this region, it may be necessary to refer to the "Terrestrial and Wetland Ecosites of Northwestern Ontario" (Racey *et al.* 1996), and the "Field Guide to the Forest Ecosystem Classification for Northwestern Ontario" (Sims *et al.* 1997). Near the southern boundary, it may be necessary to refer to the "Field Guide to Forest Ecosystems of Central Ontario" (Chambers *et al.* 1997).

...About This Guide

This guide was designed to make the use of A Forest Ecosystem Classification for northeastern Ontario as convenient as possible for the user. The introduction provides a brief history of the FEC in Northeast Region and a discussion of why the system was developed.

Section A	provides step-by-step instructions on using this FEC
Section B	provides all of the field keys required to determine ecosite, vegetation and soil types
Section C	provides descriptions of the ecosites
Section D	provides descriptions of the vegetation types
Section E	provides descriptions of the soil types
Section F	provides methods for describing soil characteristics
Section G	provides detailed descriptions of the plants used in the FEC keys
Section H	provides expert interpretations of the ecosites for management purposes
Section I	provides a listing of plant species, references and appendices on ecosite and vegetation type development

Changes in the 2000 Edition

This second (2000) edition differs from the 1994 edition in the following ways:

- the term "site type" has been replaced with "ecosite" for consistency with current ELC nomenclature; the definition is unchanged
- descriptions of ecosites, and vegetation and soil types are more robust as they are based on a larger sample
- the ecosite key has been refined and several new ecosites have been added for previously undescribed conditions
- ecosite subscripts have changed from a, b and c (indicating a gradient of increasingly coarse soil textures) in the 1994 edition, to f, m and c (indicating fine, medium and coarse soils)
- new ecosite subscripts p (poor) and r (rich) indicate relative species richness between two similar ecosites with the same ecosite number
- the vegetation type key has been replaced; the new vegetation types are more robust and are unrelated to the old types
- soil type definitions are unchanged in this version, but the descriptive material has been enhanced
- descriptive material, including fact sheets, applications and plant species descriptions, has been enhanced as needed

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Introduction

Society's expectations about what forested landscapes should provide have changed dramatically in recent years. The role of forests was once viewed primarily as resource production. Forests are now recognized as fulfilling a significant role in the ecological functioning of the landscape.

The Ministry of Natural Resources (MNR) in the strategic document "Beyond 2000" (OMNR 1999), affirmed a commitment to ecosystem management and biological diversity in its resource management activities. The development and improvement of this forest ecosystem classification (FEC) system is an important part of MNR's commitment to improving our knowledge and management of Ontario's forests.

Why Classify Ecosystems?

Ecosystems are complex interactions among species and environmental conditions. This complexity has to be simplified so that patterns and commonalities can be recognized and applied at a practical management level. This is the basis for the need for ecological land classification. Classification systems provide simple frameworks from which to understand complex ecosystems. The challenge is to create classification units which are comprehensive enough to adequately characterize the wide range of conditions found in ecosystems, yet are simple enough to apply at an operational level.

Classification systems provide a common language for improved communication among resource managers. They also provide a framework for accumulating knowledge about ecosystems from both management experience and research. Through inventory and mapping we can transfer this old and new knowledge to actual ecosystems on the land. Classification systems serve to organize and allocate ecosystem planning, management and operational activities on the basis of past experience with similar ecosystem conditions. As a stratification mechanism, it also allows us to index future ecosystem research.

Ecological Land Classification in Ontario

The pioneer of ecosystem classification in Ontario is Angus Hills, who in the 1950s wrote "A Ready Reference to the Description of the Land of Ontario and its Productivity" (1959). This work used physiography, soils, climate, landforms and vegetation to create a hierarchical land classification system for Ontario. This work focused on the coarse and medium scale classification units of Site Region and Site District (**Figure 1**). Other land classification systems have been developed for Ontario using different criteria and at different scales. For example, Rowe (1972) used forest cover to classify the province. In recent years MNR has been attempting to rationalize Hills' system in light of both federal and other provincial systems.

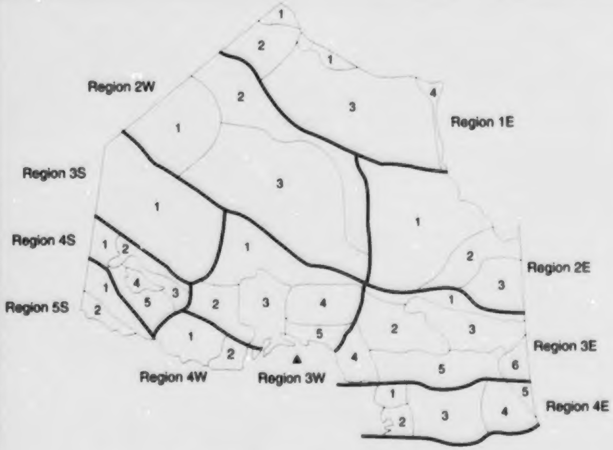


Figure 1: Ecoregions and ecodistricts in northern Ontario (adapted from Hills 1959)

The Ecological Land Classification program in Ontario is seeking to classify all of the province's ecosystems, such as:

- non forested uplands (prairie, alvar, cliff top and dunes)
- forested ecosystems (both upland and wetland)
- non forested wetlands (swamps, marshes, open fen and bogs)

The first work in ecosystem classification was done on forest communities. The "Forest Ecosystem Classification - Claybelt 3E" by Jones *et al.* (1983) was the first classification system in Ontario to focus on the lower-level classification units of ecosite and ecoelement. Following this publication were forest ecosystem classifications for MNR's Northeast Region (McCarthy *et al.* 1994), MNR's Northwest Region (Sims *et al.* 1997; Racey *et al.* 1996), MNR's Central Region (Chambers *et al.* 1997), and MNR's Southern Region (Lee *et al.* 1998).

Over the years there have been changes in the nomenclature used within the provincial Ecological Land Classification program, for example Site Regions are now called Ecoregions, and Site Districts are now called Ecodistricts. In the Northeast there has been a longer progression in nomenclature: Operational Groups became Site Types, and Site Types are now called Ecosites. As knowledge about ecosystems improves, the Ecological Land Classification program will change and grow to best represent that knowledge.

Changes in Ecosites Over Time in Nomenclature and Numbering

Operational Group	Site Type	Ecosite	Operational Group	Site Type	Ecosite
1	1	1p	9	9	9p
		1r			9r
2	2a, 2b	2	10	10	10
3	3a ,3b	3	11	11	11
4	4	4	12	12	12
5	5a	5f	13	13	13p
	5b	5m			13r
6	6a	6f	14	14	14
	6b	6m		15	15
	6c	6c		16	16
7	7a	7f			17
	7b	7m			18
		7c			19
8	8	8			20
					21

Definitions

Ecosites (ES)	are mappable, management-oriented groupings of vegetation on specific ranges of soil conditions. Ecosites occur at spatial scales ranging from 1:10,000 to 1:50,000. Ecosites have relatively uniform parent material, soils, hydrology and vegetation structure, and composition. A single ecosite may be comprised of a number of vegetation types and soil types. The mapping scales associated with ecosites are appropriate for forest-level planning and for developing site-specific management prescriptions.
Vegetation Types (V)	are mature forest plant communities based on specific ranges of plant species composition and abundance. They occur at the ecoelement level of the ELC hierarchy and at spatial scales ranging from 1:1,000 to 1:20,000.
Soil Types (SS or S)	are groups of forest soil profiles based on specific ranges of texture, depth, moisture regime, calcareousness and forest humus form. They occur at the ecoelement level of the ELC hierarchy and at spatial scales ranging from 1:1,000 to 1:20,000.

Table 1: Adapted from Lee *et al.* 1998 showing the proposed spatial hierarchy for the ELC.

Classification Unit[1]	Appropriate Scale[2]	Recommended Tools[3]	Example of Management Applications
Ecozone	1:3,000,000 10,000–1,000,000 km^2	Wiken (1986)	Ecological context for Ontario: planning; policy
Ecoprovince	1:1,000,000 10,000–100,000 km^2	Wiken (1986)	Ecological context for Ontario: planning; policy
Ecoregion	1:500,000 1,000–10,000 km^2	Hills's Site Regions of Ontario (Hills 1961, Burger 1993)	Strategic planning at regional or sub-regional levels; policy
Ecodistrict	1:250,000–1:500,000 100–1,000 km^2	Hills's Site Districts of Ontario (Hills 1961)	Strategic planning at sub-regional level, watershed plans; policy
Ecosection	1:100,000–1:250,000 1,000–10,000 ha	Ontario Land Inventory (OMNR 1977), Physiography of Southern Ontario (Chapman and Putnam 1984)	Major landform contributions for forest prime land, broad habitat trends, watershed and subwatershed plans
Ecosite	1:10,000–1:20,000 10–100 ha	Field Guide to Forest Ecosystems of Northeastern Ontario, 2nd Edition FG-001	Ecosystem mapping; conservation; inventory; regional planning; evaluation; silviculture ground rules; wildlife habitat; subwatershed plans
Ecoelement	1:2,000–1:10,000 100–100,000 m^2	Vegetation and Soil Types in the Field Guide to Forest Ecosystems of Northeastern Ontario, 2nd Edition FG-001	Site and stand level research; inventory; development proposal; environment impact assessment; evaluation; conservation

Notes:
1. Units according to the Canada Committee on Ecological Land Classification (CCELC) (Environmental Conservation Service Task Force 1981; Wiken 1986).
2. Appropriate scales are identified, first in terms of appropriate cartographic scale, then in terms of typical size of resolution.
3. Not all levels of ELC are represented by products suited for use in Northeastern Ontario. Recommended tools include existing maps, classifications and publications available to land managers that represent ecological features at appropriate scales.

Scope of the Classification

This FEC is part of a continuing effort. As further research takes place, and the classification system is expanded and refined, this field guide will be updated. We are also developing methods to inventory and map FEC ecosites both by conventional means, and in a GIS environment, using remotely-sensed data and computer modelling systems.

This FEC is meant to be a practical tool for resource managers in northeastern Ontario (**Figure 2**). It can be used for a variety of forest and site level applications including:

- forest and landscape level planning
- timber and habitat supply analyses
- landscape and biodiversity analyses
- harvest planning
- successional studies
- Natural Heritage Areas management
- pre-harvest silvicultural prescriptions
- vegetation management
- wildlife habitat studies and assessments
- sampling stratification (e.g. growth and yield studies)
- forest engineering.

The field keys are intended for use at the stand level, normally within relatively small (10 to 100 ha), mature, undisturbed forested areas. This FEC was not designed for use in immature stands (less than approximately 40 years old) or on disturbed sites. However, with due caution, the pre-disturbance ecosite can often be estimated for these areas. Soil features can be examined on undisturbed areas within the site to determine the appropriate major ecosite grouping. Residual pockets of undisturbed vegetation within the area, or vegetation in immediately adjacent, mature stands on similar site conditions, can then be used to predict the approximate ecosite. Historical records and air photos are also useful in determining pre-disturbance vegetation conditions.

In Forest Management Planning, ecosites can be used to describe forest units, in developing silvicultural ground rules and in reporting prescriptions in annual plans. Further information about the NE-FEC ecosites, and information about silvicultural prescriptions are contained in the "Silvicultural Guide to Managing for Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario" (OMNR 1997).

Northeast region does not have a wetland classification system of its own, however, the "Field Guide to the Wetland Ecosystem Classification for Northwestern Ontario (Harris *et al.* 1996) was tested for its utility in the northeast. The testing showed that this system could be used in the northeast, but that some modifications were necessary to improve the fit. Until such time as the modifications have been made to the northwest wetland classification, the existing classification can be used to classify wetlands in the northeast.

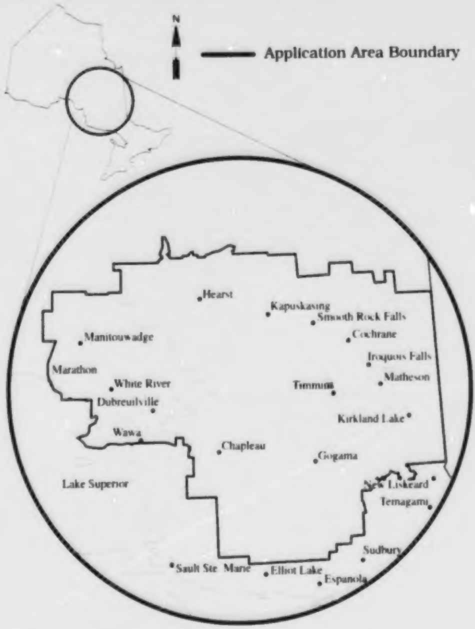

N
Application Area Boundary
Hearst
Kapuskasing
Smooth Rock Falls
Cochrane
Manitouwadge
Iroquois Falls
Marathon
White River
Timmins
Matheson
Dubreuilville
Kirkland Lake
Wawa
Chapleau
Gogama
Lake Superior
New Liskeard
Temagami
Sudbury
Sault Ste Marie
Elliot Lake
Espanola

Figure 2: FEC application area for northeastern Ontario.

Soils, Geology and Forests:

Soils in the northeast are young by geologic standards, having developed over the previous 8,000 – 12,000 years since the last glaciation. Much of the original soil material was removed during the glacial advance. During the advance and retreat of the ice mass our present soil materials were deposited. Lacustrine materials were deposited under glacial lakes, glacio-fluvial materials were deposited by the melt waters running off the glacier, morainal materials were deposited by ice action. Organic deposits have developed subsequently in areas of poor drainage.

On uplands, forest humus forms such as mor and moder soils are relatively common since they have been able to develop over the short time span since the glaciation and in the cold climate found in the northeast. Mulls take longer to develop and do so more quickly in warmer climates, so they are uncommon in the northeast. Mixing of the mineral and organic soil by soil macrofauna is also required for a mull to develop so they are mainly found on sites with a warm microclimate and usually with deciduous tree cover. On poorly drained soils, peaty mors, particularly fibrimors, are very common.

The application area for this FEC includes a number of Hill's site districts (now referred to as ecodistricts - Figure 1). These ecodistricts form a strong ecological base for the discussion of the soils, geology and forest cover of northeastern Ontario.

The most northern part of the application area includes ecodistricts 3E1 and 3E3 which were both overlaid by the waters of the glacial Lake Ojibway. The Smokey Falls ecodistrict (3E1) is a relatively flat plain of lacustrine clay and loam which is moderate to high in lime content. The silt and clay are up to 9 m deep and the topography is gently rolling due to the underlying bedrock. Cochrane ecodistrict (3E3) is also a lacustrine clay and silt plain but with very high to moderate lime clay which is usually more than 9 m deep. There is very little surface rock, and the topography is very gentle (slopes rarely greater than 5 percent) as both eskers and bedrock are covered by the clay and silt deposits. Peat soils are very common making up 50 percent of the area of the ecodistrict (Ketcheson and Jeglum 1972). Lakes are relatively few, and kettle lakes, created by large chunks of ice falling off the glacier, are a common lake form. Clay banked rivers are the dominant waterways as they slowly wind their way across the landscape.

Black spruce occurs in seemingly endless stands on both the uplands and lowlands of ecodistricts 3E1 and 3E3. Across the extensive organic deposits are patterns of ecosites starting with ES9r at the edge of the deposit and grading into ES13r, ES12, ES11 and ES14 as you move farther out onto deeper and more nutrient poor organic soils. Tamarack (ES9p and ES13p) and white cedar (ES9r and ES13r) are often found around these organic deposits as well as on toe slopes, the bottoms of valleys and along waterways. The clayey uplands often have a pattern of mixedwood communities with ES7f, ES6f and ES5f growing on the tops of the hills and ES10 in the silty deposits between ES9r and ES9p.

Outwash deposits, old beaches and eskers are often dominated by large stands of jack pine, which does well with the coarser soils and low nutrient availability. Boreal mixedwood communities are also common on these landforms. On the gradual slope down the side of an esker, for example, you will often find the top of the slope with mixedwoods such as ES7c, ES6c and ES3, grading down into ES2 and ES4 which have large jack pine contents and then perhaps an ES8.

To the west is the Hornepayne ecodistrict (3E2) which is quite different from 3E1 and 3E3. This area is a smooth to gently rolling plain with low ridges where silty sand and loam are common. Much of this area is well drained, having only 35 percent peatland (Ketcheson and Jeglum 1972). Lakes are a much more common component of this landscape. This area is rockier and has more gravel deposits than the ecodistricts 3E3 and 3E1 which make a favourable environment for jack pine (ES2). The rolling deep coarse loamy to silty landscape often has a pattern of ES7m, ES6m or ES5m on the tops of the ridges and, ES10 or ES9p in the intervening low areas.

To the south is the Foleyet ecodistrict (3E5) with gently rolling plains of thinly covered rock knobs, sandy outwash and silty depressions. The materials here are generally granitic. All texture and drainage classes are found in 3E5, with only 18 percent of the area in peatland (Ketcheson and Jeglum 1972). A typical sequence of ecosites within this landscape would have either ES1p or ES1r on the rock knobs, ES4 or ES3 on the side of the knobs where there is deeper soil, and ES8 in a silty depression.

To the east is the Kirkland Lake ecodistrict (3E6) where moderately broken plains of granitic and low-base bedrock are thinly covered with sand and silty sand. All of the soil drainage classes are about equally distributed here. The forest here is basically boreal in nature but you will often find Great Lakes–St. Lawrence Forest communities such as ES15, ES16 and ES17, on areas with warmer than normal microclimate. There is a shift in the species mix from dense conifer and conifer mixedwoods of the more northern ecodistricts to a more equal mix of conifer and deciduous species. A sequence of ES7c or ES6c on the top of a ridge grading down into ES3, then 2, then 4, ending in an ES8 at the bottom of the slope would be a common pattern. Red and white pine (ES18 to ES21) are often found along ridges and rocky shorelines.

The southern most part of the application area is made up of parts of ecodistricts 4E3 and 4E4. The Mississagi ecodistrict (4E3) is an area of gently rolling plain made up of stony sandy till over bedrock with frequent flats and ridges of water-laid sand. The materials are often granitic in origin. The soils on the rocky uplands range from dry to wet depending on the depth of the soil and the position on the slope. This area is about 18 percent peatland (Ketcheson and Jeglum 1972). These shallow sandy to coarse loamy till landscapes will frequently have ES1r or ES1p on the very shallow ridge tops which will grade down into ES4 or ES3 on the side of the slope where more soil has developed. The flatter deeper soils between the rocky uplands will frequently be ES6c. Sugar maple, red maple and yellow birch (ES15, ES16 and ES17) occur here on warmer than normal microclimate sites.

The Temagami ecodistrict (4E4) is an area of rolling plain and rock knobs. It is shallowly covered with stony silty sand and occasional areas of sorted coarse and medium sand. Soils range from dry to wet depending on the depth of the soil and its slope position. This landscape is only 12 percent peatland. Temagami is well known for its red and white pine communities (ES18 to ES21), though the portion of the site district within the application area of this FEC does not include the pine communities that Temagami is famous for (these are covered by the Central Region FEC; Chamber *et al.* 1997). ES1p and ES1r are common on the shallow uplands and rock knobs. Side slopes will frequently have ES4 or ES3 on them with ES8 occurring on the areas of silty soil which are often in the depressions between the ridges. Where soils are deeper, mixedwoods of ES6c and ES6m are common. Black ash can be found along some of the river valleys (ES10) along with both red and white pine (ES18 to ES21).

Using the Classification

The FEC system can be applied to any mature forest ecosystem in northeastern Ontario by individuals with a basic knowledge of plant identification and the field description of forest soils. Field work must be done during the growing season as the FEC keys rely on plant indicators. These keys allocate a point on the ground. If you are mapping them refer to Ecosite Mapping Concepts (pages C 75 and C 76). There is a three-step allocation process. Depending on the application, it may not be necessary to complete all three steps.

Step 1. **Identifying an Ecosite:** A sampling point within a forest stand is allocated to one of 29 ecosites. To assist in the stand allocation process, a field key has been developed that is based on soil properties, modified by the presence of indicator plant species (pages B 2 to B 7).

Step 2. **Identifying a Vegetation Type:** The sampling point is allocated to one of 28 vegetation types. A vegetation field key has been developed, based on the presence or general abundance of indicator plant species (pages B 8 to B 11).

Step 3. **Identifying a Soil Type:** The sampling point is allocated to one of 23 soil types. A soil field key has been developed that is based on soil features (depth to bedrock, mineral soil texture, the presence or absence of free carbonates, soil moisture regime, organic matter thickness and forest humus form) (pages B 12 and B 13).

There are often several common names for the same plant species, therefore scientific names provide a more consistent nomenclature. However, some people prefer to use common names. The ecosite and vegetation type keys are provided in both scientific and common name formats. On the ecosite fact sheets, the vegetation descriptions use common names. Lists of common names in English and French, and scientific names for all the plant species in this field guide are provided in Appendix A.

Using the Ecosite Keys

1. Choose a 10 m by 10 m area representative of the surrounding stand (avoid edges, since they are transition zones between types). More than one plot may be needed in a stand.
2. Determine if sugar maple, red maple, yellow birch, red pine and/or white pine are present in the main canopy. If yes, go directly to step 4.
3. Dig a soil pit or use a soil auger to determine the following:
    - average mineral soil depth over bedrock
    - thickness of organic matter
    - thickness of the Ah horizon (Ah is a dark coloured, mineral, surface soil horizon that is enriched with organic matter)
    - dominant mineral soil texture to 60 cm (dominant refers to the thickest horizon or the greatest thickness of summed horizons having the same texture)
    - depth to prominent mottling or gley colours, measured from the top of the mineral soil. Mottles are irregularly shaped, rusty coloured spots on the surface of soil "peds" or structural units; as a general rule, prominent mottles are bright enough to be visible from arm's length

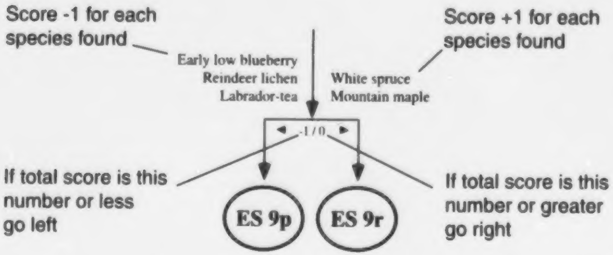
    Note: Root channels and concretions may look like mottles. Gley colours develop in saturated soils. They appear as patches or continuous zones of grey-blue in the soil profiles.

    If using a soil auger, lay the cores down in sequence to view them as a profile.

    Note: These first three steps take you to one of the eight major ecosite groupings.

4. For the major ecosite grouping established above, determine which of the indicator plant species listed in the ecosite key are present in the sampling plot. Use these species to go through the successive divisions of the key. When tree species are listed in the key with a shrub modifier (e.g. black spruce shrub) this refers to saplings less than 10 m in height. When "spp." occurs after a genus name (e.g. *Sphagnum* spp.), any species within the genus can be used. Score only one for the genus, not one for each species.
    - score -1 for each of the indicator species found on the left side of a decision point and add together
    - score +1 for each of the indicator species found on the right side of a decision point and add together
    - combine the two sums for a total score at the decision point

- if the total score is the same as or greater than the number on the right side of the decision point, proceed right
- if the total score is the same as or less than the number on the left side of the decision point, proceed left



Score -1 for each species found

Score +1 for each species found

If total score is this number or less go left

If total score is this number or greater go right

- continue through the successive divisions of the key to determine the ecosite

5. Compare your visual impression of the surrounding stand with the information on the ecosite fact sheet. The fact sheets provide modal (average) descriptions of site conditions. If there are major discrepancies, this may indicate an error in the use of the key. Carefully examine the sample point for the presence of any indicator species that might have been missed and work through the key again. If there are still inconsistencies, make a note of the discrepancy and use the ecosite determined through the key.

Using the Vegetation and Soil Type Keys

Using the Vegetation Type Keys

To allocate a sampling point to a vegetation type, follow the procedure listed for the ecosite key, steps 1 and 4 in Using the Ecosite Keys (page A 2).

When "spp." occurs after a genus name (e.g. *Sphagnum* spp.), any species within the genus can be used. Score only one for the genus, not one for each species present. When a tree species is listed in the key (e.g. black spruce) this refers to trees greater than or equal to 10 m in height. When a tree species is listed in the key with a shrub modifier (e.g. black spruce shrub) this refers to saplings less than 10 m in height.

Match your visual impression of the vegetation at the sampling point with the information on the vegetation type fact sheets (Section D). A more detailed breakdown of the species composition and abundance is included in a table on page D 34. Compare the species that you see at the sample point with the table.

Major discrepancies may indicate an error in the use of the key. Carefully examine the sample point for the presence of any indicator species that might have been missed and work through the key again. If there are still inconsistencies, make a note of the discrepancy and use the vegetation type determined through the key.

Using the Soil Type Key

1. Choose a location within the 10 m by 10 m sample plot used to determine the ecosite and vegetation types.
2. Dig a soil pit or use a soil auger to determine the following (note that some soil features are the same as those used to determine the ecosite):
    - average mineral soil depth over bedrock
    - presence of boulder pavement (a continuous layer of boulders at the surface with less than 30 cm of mineral soil)
    - thickness of organic matter
    - if the organic matter depth is 40 cm or greater, determine the average level of decomposition (fibric, mesic or humic) to 40 cm (refer to page F 25)
    - thickness of Hi and/or Ah (+H) horizons. Hi and/or Ah refers to forest humus forms in which there is a mixing of the organic and mineral material to varying degrees. These forest humus forms are black or dark brown and may include black H (humic) horizons (refer to page F 23)

- texture of the mineral soil C horizon (unweathered soil parent material). Parent material is normally found at depths from 50 to 100 cm in northeastern Ontario
- soil moisture regime (see page F 12 for Soil Moisture Regime for Deep Soils (Chart A), and page F 18 for Soil Moisture Regime and Drainage for Shallow Soils (Chart D)
- presence of free carbonates to 100 cm (test for effervescence using a 10 percent HCl solution)

When a soil profile is stratified (i.e. contains layers of different textures) it is necessary to identify the effective textural layer to use to determine soil texture and soil moisture regime. Use the key on page F 17 to identify the effective textural layer.

In some cases, it will not be necessary to measure all the soil features listed above. For example, for the very shallow soil types (SS1 to SS4), it is only necessary to measure the average mineral and/or organic soil depth over bedrock.

3. Using the information obtained in step 2, work through the successive divisions of the key to determine the soil type.
4. Check for errors by comparing the features observed in the soil sample with the description of the soil type. If the soil type description does not match the soil sample, check your decisions and work through the key again.

Soil Type Modifiers

There are additional soil and site features, relevant to forest management activities, which are not directly considered in the soil type classification for northeastern Ontario. These features include surface stoniness, proportion of subsurface coarse fragments within the soil profile, mineral soil depth classes in addition to very shallow, and topographic variability of the landscape including site aspect, degree of slope, slope complexity and site position on the slope. Detailed instructions for describing these soil features in the field can be found in the "Field Manual for Describing Soils in Ontario" (Ontario Centre for Soil Resource Evaluation 1993).

If you require more detailed information than is provided by the soil type classification, features other than the diagnostic criteria used in the soil type key can be assessed in the field. These extra features can be noted with the soil types as subscripts. The use of subscript modifiers will facilitate the inclusion of these features in mapping programs.

Examples of Soil Type Modifiers

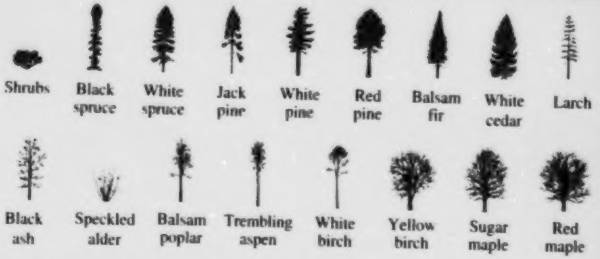
Coarse fragments reduce the effective rooting volume of a soil, reduce moisture retention capacity, increase drainage, and may affect the operation of mechanical site preparation equipment. There is some evidence that soils with more than 35 percent coarse fragments by volume can reduce the productivity of boreal tree species (Schmidt and Carmean 1988). Soil types with more than 35 percent coarse fragments can be indicated by a "c" subscript (e.g. $S5_c$).

The Soil Moisture Regime and Drainage for Shallow Soils (Chart D) key (page F 18) recognizes more classes of soil depth than are used in the soil type key:

bedrock	< 5 cm
very shallow	5–30 cm
shallow	31–60 cm
moderately deep	61–120 cm
deep	> 120 cm

If desired, soil depth modifiers can be used as subscripts to the soil type names (e.g. $S6_m$).

Short Forms, Symbols and Definitions



Conifer: a stand dominated by coniferous tree species, with less than ten percent cover of hardwoods in the main canopy (trees more than 10 m in height).

Coniferous Mixedwood: a stand dominated by coniferous tree species, with less than 30 percent cover of hardwoods in the main canopy.

Mixedwood: a stand with approximately equal percentage cover of coniferous and hardwood trees.

Hardwood Mixedwood: a stand dominated by hardwood tree species, with less than 30 percent cover of conifers in the main canopy.

Hardwood: a stand dominated by hardwood tree species, with less than ten percent cover of conifers in the main canopy.

Overstorey: all trees that are greater than or equal to 10 m in height.

Understorey: trees and woody shrubs less than 10 m in height, herbaceous vegetation, mosses, liverworts and lichens.

Main canopy: trees in dominant and co-dominant canopy positions.

Sub-canopy: trees in secondary canopy positions, in stands with a complex canopy structure.

Regeneration: all tree saplings and seedlings that are less than 10 m in height.

Tall Shrubs: a group of woody shrubs, with a generally tall growth habit (2 to 10 m in height), e.g. speckled alder, mountain maple, beaked hazel, cherries and serviceberries.

Low Shrubs: a group of woody shrubs with a generally low growth habit (less than 2 m in height), e.g. bush honeysuckle, wild red raspberry, squashberry, honeysuckles and currants.

Ericaceous: a group of shrubs in the Heath family, including blueberry, cranberry, wintergreen, laurel, bearberry, bog rosemary, leatherleaf, trailing arbutus and Labrador-tea.

Herbs: includes ferns, fern allies, grasses, sedges and herbs or forbs.

Feathermoss: a group of branched, feather-like mosses. In this field guide, the term refers to Schreber's moss, stair-step moss and plume moss.

Sphagnum: refers to any species of the genus sphagnum (peat moss).

...Short Forms, Symbols and Definitions

Occurrence/Abundance Classes for Plant Species and Forest Floor Materials

abundant	occurred in > 66 percent of sample plots, with average cover ≥ 10 percent
common	occurred in 40 to 66 percent of sample plots, with average cover ≥ 10 percent
sparse	occurred in < 40 percent of sample plots, with average cover ≥ 10 percent
present	occurred in > 66 percent of sample plots with average cover < 10 percent

Herb & Shrub Species Richness Classes

rich	> 15 species
medium	10 to 15 species
poor	< 10 species

Soil Feature Histograms – Frequency Classes

▬	> 50 percent
▬	20 to 50 percent
▭	5 to 19 percent

Abundance of Coarse Fragments in Soil Profile

many	> 30 percent by volume
moderate	10 to 30 percent
few	< 10 percent

Hummock Height Classes

high	> 60 cm
moderate	30 to 60 cm
low	< 30 cm

Moisture Regime Classes

On the moisture regime histograms, note that the dry (Ø - theta) and moderately dry (0 - zero) classes are grouped together.

Particle Sizes

S	sand or sandy	v	very
L	loam or loamy	c	coarse
Si	silt or silty	m	medium
C	clay	f	fine

Physical examples of the primary particle sizes are provided for reference at the back of this guide.

Soil Texture Classes

SDY	sandy (vcS, cS, mS, fS, LvcS, LcS, LmS and LfS)
CLMY	coarse loamy (vfS, LvfS, SivcS, SicS, SimS, SifS and SivfS)
MLMY	medium loamy (vcSL, cSL, mSL, fSL, vfSL and L)
SIY	silty (Si and SiL)
FLMY	fine loamy (SCL, CL and SiCL)
CLY	clayey (SC, SiC and C)
ORG	organic soils

Humus Forms

Upland Humus Forms

MULL	includes compact, fine, medium and coarse mulls
MODER	includes typical, raw and mull-like moders
HMOR	fibrihumimor and humimor
FMOR	humifibrimor and fibrimor

Organic Humus Forms

PEATY MORS	classified according to the degree of decomposition (HUMIC, MESIC and FIBRIC)

Descriptions of these humus forms can be found on pages F 23 to F 24 and F 25.

Modes of Deposition

ROCK	bedrock or shallow drift over bedrock
CTILL	coarse-textured soils deposited by glacial ice (basal till, ground, ablation and end moraines)
FLU	coarse-textured soils of glaciofluvial origin (deposited by flowing water)
AEOLIAN	soils of eolian origin (deposited by wind)
FTILL	fine-textured morainal soils deposited by glacial ice (primarily clay tills, in the Clay Belt and surrounding area)
LAC	soils of glaciolacustrine (lakebed) origin
ORG	organic soils

Refer to page F 2 for more information.

...Short Forms, Symbols and Definitions

Organic Horizons

L 〰

F ▒

H ■

Hi ■

Of ▥

Om □

Oh □

Mineral Soil Horizons

Ah ■

Bm □

Bt □

C/Ck □

Ae □

Bf □

BC □

Mottles and Gley

g (mottles) ⁘

Bedrock □

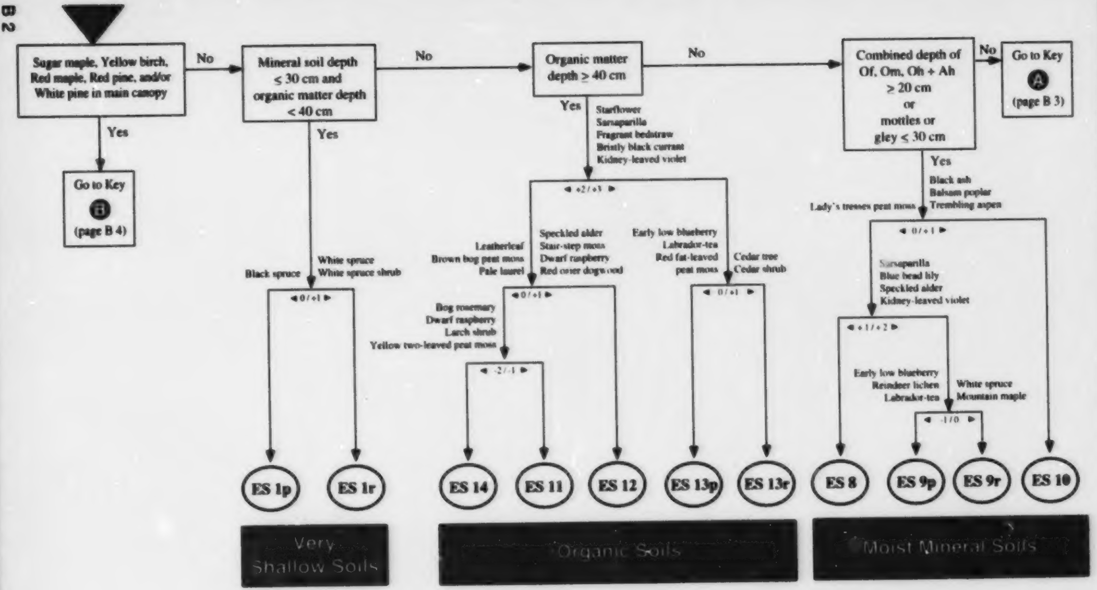
G (gley) □

Coarse fragments ○ ○ ○

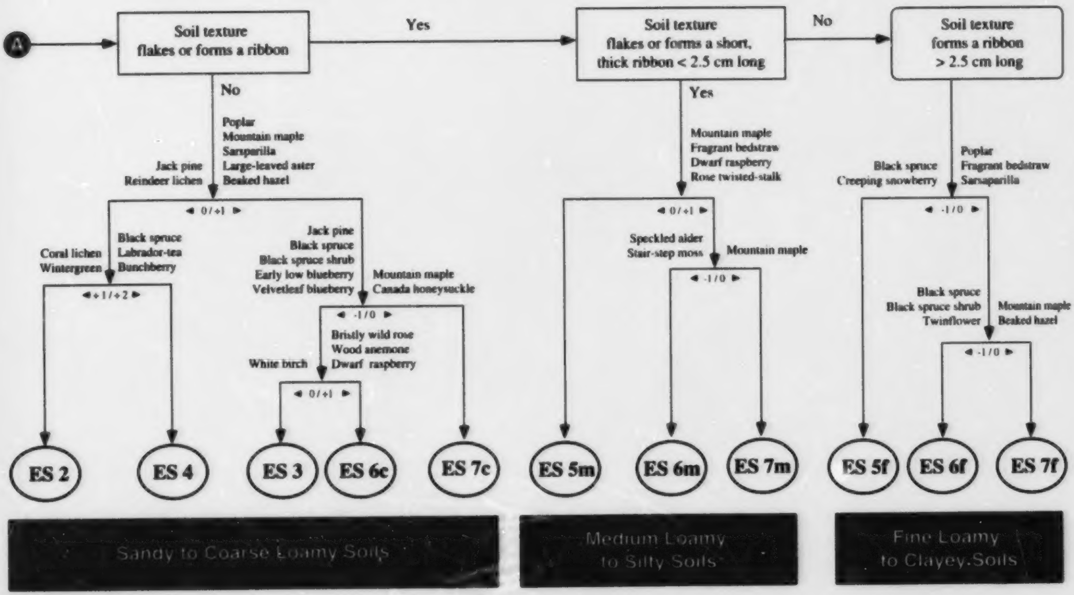
See pages F 21 and F 23 for definitions of these soil horizons.

Field Keys

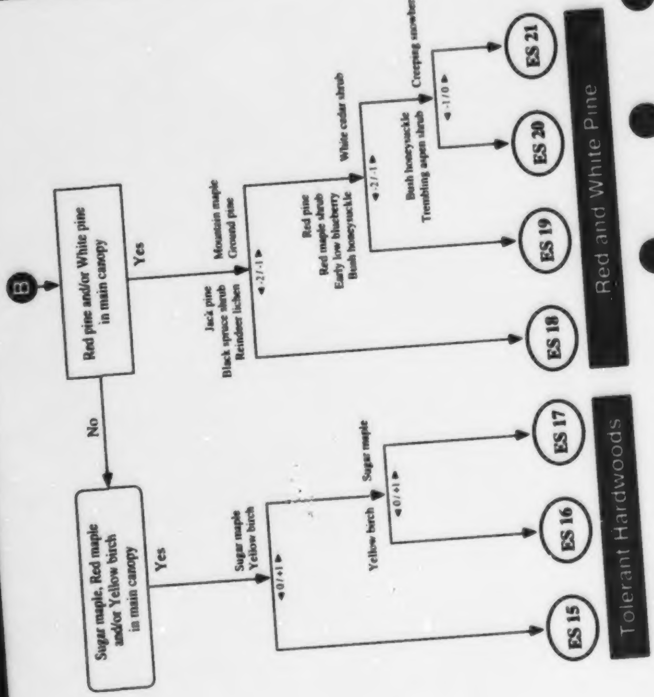
Ecosite Key (Common Names)


Sugar maple, Yellow birch, Red maple, Red pine, and/or White pine in main canopy
Yes
Go to Key B (page B 4)
No
Mineral soil depth ≤ 30 cm and organic matter depth < 40 cm
Yes
Black spruce
White spruce
White spruce shrub
◄ 0/+1 ►
ES 1p
ES 1r
Very Shallow Soils
No
Organic matter depth ≥ 40 cm
Yes
Starflower
Sarsaparilla
Fragrant bedstraw
Bristly black currant
Kidney-leaved violet
◄ +2/+3 ►
Leatherleaf
Brown bog peat moss
Pale laurel
Speckled alder
Stair-step moss
Dwarf raspberry
Red osier dogwood
◄ 0/+1 ►
Bog rosemary
Dwarf raspberry
Larch shrub
Yellow two-leaved peat moss
◄ -2/-1 ►
Early low blueberry
Labrador-tea
Red fat-leaved peat moss
Cedar tree
Cedar shrub
◄ 0/+1 ►
ES 14
ES 11
ES 12
ES 13p
ES 13r
Organic Soils
No
Combined depth of Of, Om, Oh + Ah ≥ 20 cm or mottles or gley ≤ 30 cm
No
Go to Key A (page B 3)
Yes
Lady's tresses peat moss
Black ash
Balsam poplar
Trembling aspen
◄ 0/+1 ►
Sarsaparilla
Blue bead lily
Speckled alder
Kidney-leaved violet
◄ +1/+2 ►
Early low blueberry
Reindeer lichen
Labrador-tea
White spruce
Mountain maple
◄ -1/0 ►
ES 8
ES 9p
ES 9r
ES 10
Moist Mineral Soils

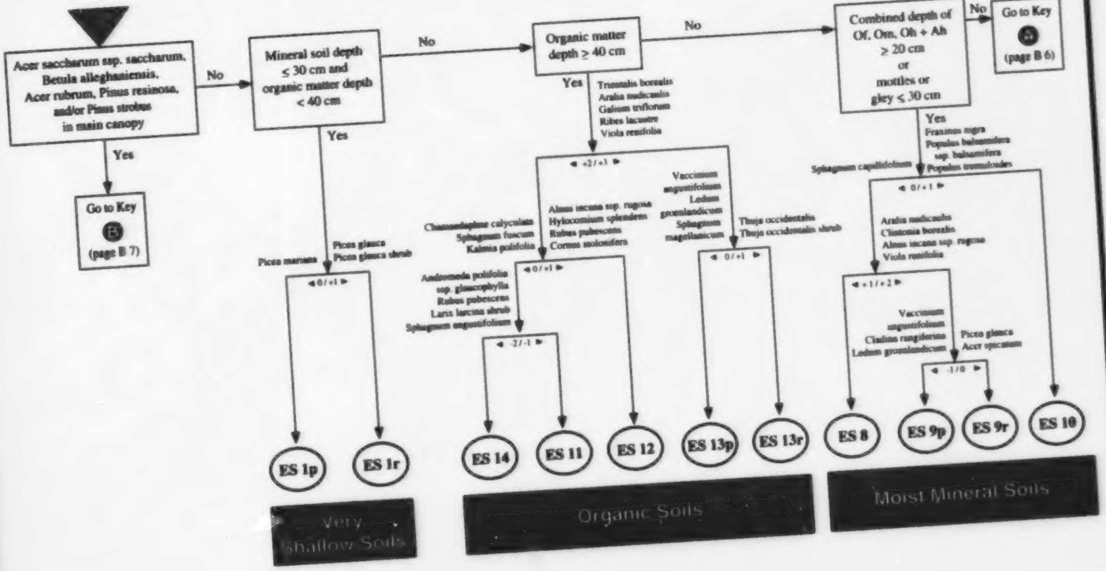
...Ecosite Key (Common Names)


A
Soil texture flakes or forms a ribbon
Yes
No
Soil texture flakes or forms a short, thick ribbon < 2.5 cm long
No
Soil texture forms a ribbon > 2.5 cm long
Yes
Jack pine
Reindeer lichen
Poplar
Mountain maple
Sarsparilla
Large-leaved aster
Beaked hazel
0/+1
Coral lichen
Wintergreen
Black spruce
Labrador-tea
Bunchberry
+1/+2
Jack pine
Black spruce
Black spruce shrub
Early low blueberry
Velvetleaf blueberry
Mountain maple
Canada honeysuckle
-1/0
White birch
Bristly wild rose
Wood anemone
Dwarf raspberry
0/+1
Mountain maple
Fragrant bedstraw
Dwarf raspberry
Rose twisted-stalk
0/+1
Speckled alder
Stair-step moss
Mountain maple
-1/0
Black spruce
Creeping snowberry
Poplar
Fragrant bedstraw
Sarsaparilla
-1/0
Black spruce
Black spruce shrub
Twinflower
Mountain maple
Beaked hazel
-1/0
ES 2
ES 4
ES 3
ES 6c
ES 7c
ES 5m
ES 6m
ES 7m
ES 5f
ES 6f
ES 7f
Sandy to Coarse Loamy Soils
Medium Loamy to Silty Soils
Fine Loamy to Clayey Soils

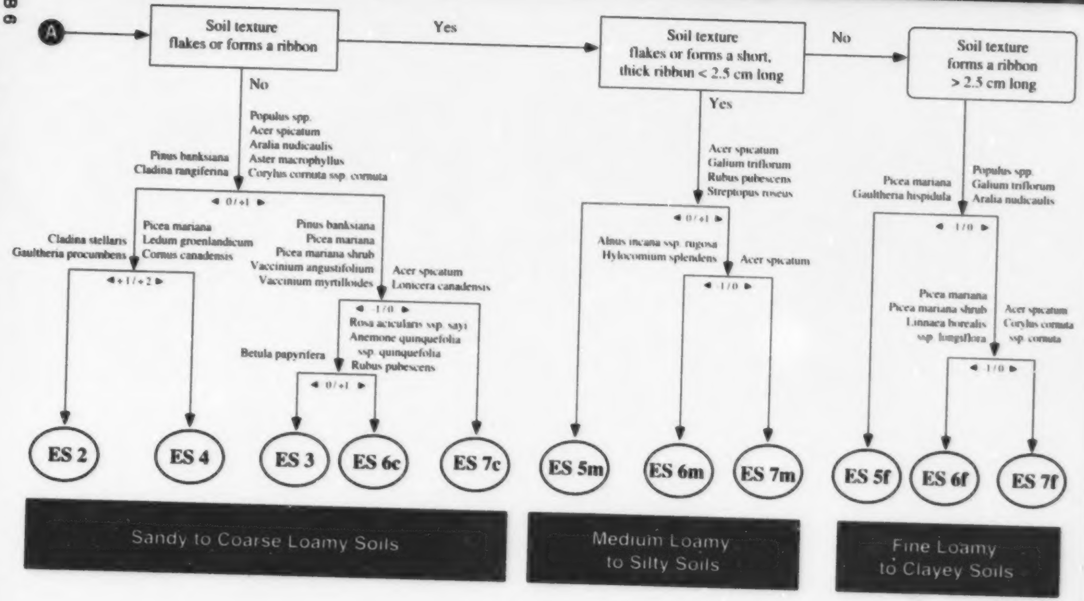
...Ecosite Key (Common Names)


B
Red pine and/or White pine in main canopy
Yes
No
Jack pine
Black spruce shrub
Reindeer lichen
◄-2/-1►
Mountain maple
Ground pine
Red pine
Red maple shrub
Early low blueberry
Bush honeysuckle
◄-2/-1►
White cedar shrub
Bush honeysuckle
Trembling aspen shrub
◄-1/0►
Creeping snowberry
ES 18
ES 19
ES 20
ES 21
Red and White Pine
Sugar maple, Red maple and/or Yellow birch in main canopy
Yes
◄0/+1►
Sugar maple
Yellow birch
Yellow birch
◄0/+1►
Sugar maple
ES 15
ES 16
ES 17
Tolerant Hardwoods

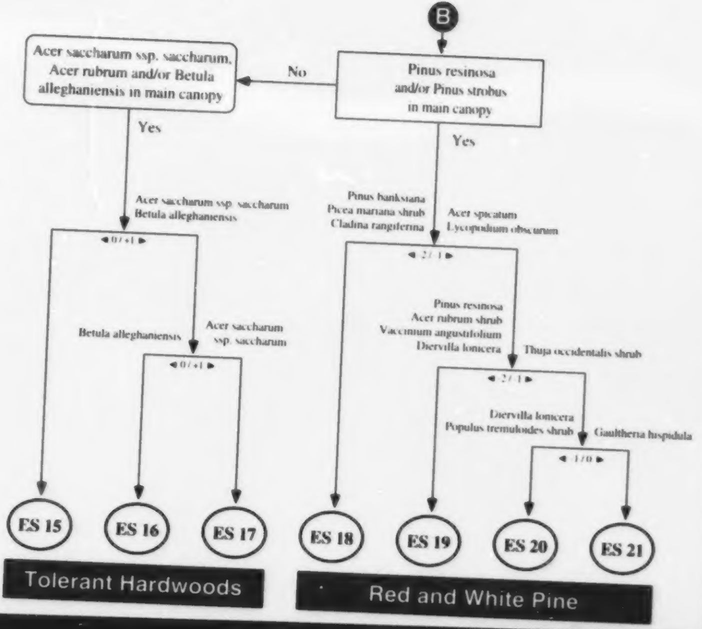
Ecosite Key (Latin Names)


Acer saccharum ssp. saccharum, Betula alleghaniensis, Acer rubrum, Pinus resinosa, and/or Pinus strobus in main canopy
Yes
Go to Key B (page B 7)
No
Mineral soil depth ≤ 30 cm and organic matter depth < 40 cm
Yes
Picea mariana
Picea glauca
Picea glauca shrub
◄ 0 / +1 ►
ES 1p
ES 1r
Very Shallow Soils
No
Organic matter depth ≥ 40 cm
Yes
Trientalis borealis
Aralia nudicaulis
Galium triflorum
Ribes lacustre
Viola renifolia
◄ +2 / +3 ►
Chamaedaphne calyculata
Sphagnum fuscum
Kalmia polifolia
Alnus incana ssp. rugosa
Hylocomium splendens
Rubus pubescens
Cornus stolonifera
◄ 0 / +1 ►
Andromeda polifolia ssp. glaucophylla
Rubus pubescens
Larix laricina shrub
Sphagnum angustifolium
◄ -2 / -1 ►
ES 14
ES 11
ES 12
Vaccinium angustifolium
Ledum groenlandicum
Sphagnum magellanicum
Thuja occidentalis
Thuja occidentalis shrub
◄ 0 / +1 ►
ES 13p
ES 13r
Organic Soils
No
Combined depth of Of, Om, Oh + Ah ≥ 20 cm or mottles or gley ≤ 30 cm
No
Go to Key S (page B 6)
Yes
Fraxinus nigra
Populus balsamifera ssp. balsamifera
Populus tremuloides
Sphagnum capillifolium
◄ 0 / +1 ►
Aralia nudicaulis
Clintonia borealis
Alnus incana ssp. rugosa
Viola renifolia
◄ +1 / +2 ►
Vaccinium angustifolium
Cladina rangiferina
Ledum groenlandicum
Picea glauca
Acer spicatum
◄ -1 / 0 ►
ES 8
ES 9p
ES 9r
ES 10
Moist Mineral Soils

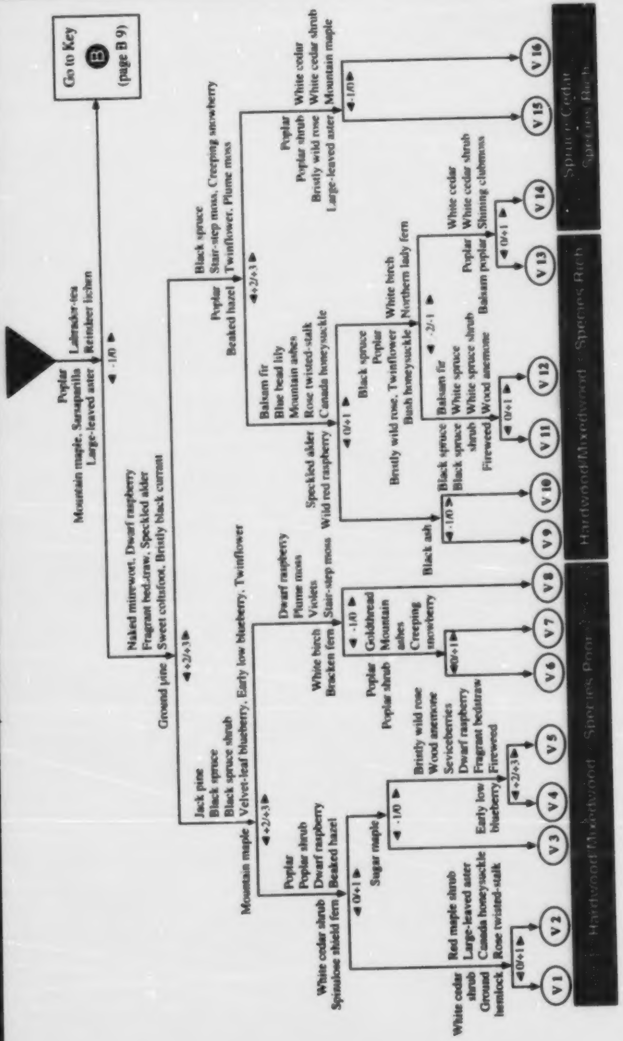
...Ecosite Key (Latin Names)


A
Soil texture flakes or forms a ribbon
Yes
No
Soil texture flakes or forms a short, thick ribbon < 2.5 cm long
No
Yes
Soil texture forms a ribbon > 2.5 cm long
Pinus banksiana
Cladina rangiferina
Populus spp.
Acer spicatum
Aralia nudicaulis
Aster macrophyllus
Corylus cornuta ssp. cornuta
◄ 0/+1 ►
Cladina stellaris
Gaultheria procumbens
Picea mariana
Ledum groenlandicum
Cornus canadensis
◄ +1/+2 ►
Pinus banksiana
Picea mariana
Picea mariana shrub
Vaccinium angustifolium
Vaccinium myrtilloides
Acer spicatum
Lonicera canadensis
◄ -1/0 ►
Rosa acicularis ssp. sayi
Anemone quinquefolia ssp. quinquefolia
Rubus pubescens
Betula papyrifera
◄ 0/+1 ►
Acer spicatum
Galium triflorum
Rubus pubescens
Streptopus roseus
◄ 0/+1 ►
Alnus incana ssp. rugosa
Hylocomium splendens
Acer spicatum
◄ -1/0 ►
Picea mariana
Gaultheria hispidula
Populus spp.
Galium triflorum
Aralia nudicaulis
◄ -1/0 ►
Picea mariana
Picea mariana shrub
Linnaea borealis ssp. longiflora
Acer spicatum
Corylus cornuta ssp. cornuta
◄ -1/0 ►
ES 2
ES 4
ES 3
ES 6c
ES 7c
ES 5m
ES 6m
ES 7m
ES 5f
ES 6f
ES 7f
Sandy to Coarse Loamy Soils
Medium Loamy to Silty Soils
Fine Loamy to Clayey Soils

...Ecosite Key
(Latin Names)

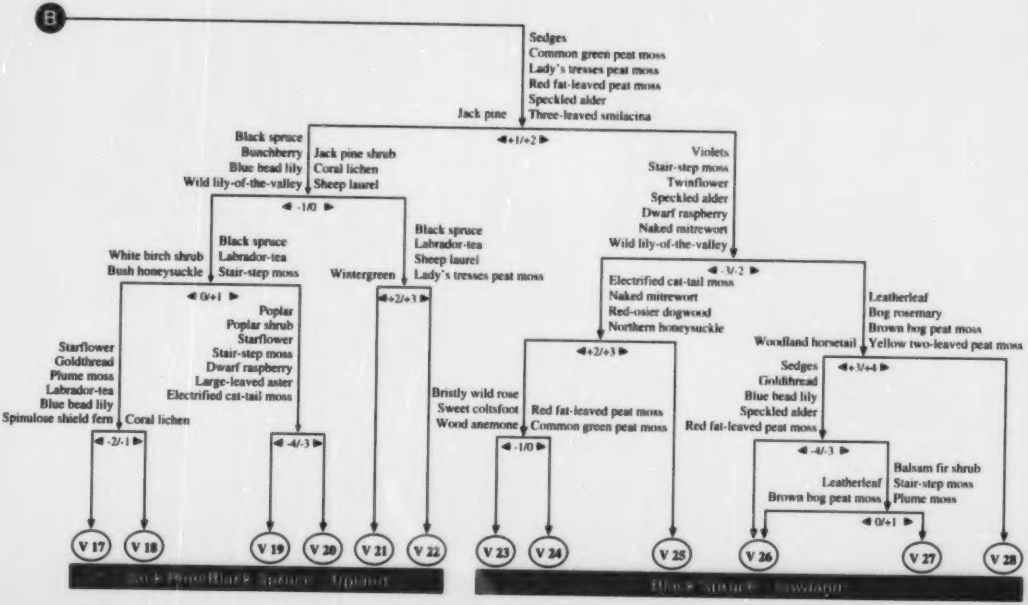

B
Pinus resinosa and/or Pinus strobus in main canopy
No
Yes
Acer saccharum ssp. saccharum, Acer rubrum and/or Betula alleghaniensis in main canopy
Yes
Acer saccharum ssp. saccharum
Betula alleghaniensis
◄ 0 / +1 ►
Betula alleghaniensis
Acer saccharum ssp. saccharum
◄ 0 / +1 ►
Pinus banksiana
Picea mariana shrub
Cladina rangiferina
Acer spicatum
Lycopodium obscurum
◄ 2 / 1 ►
Pinus resinosa
Acer rubrum shrub
Vaccinium angustifolium
Diervilla lonicera
Thuja occidentalis shrub
◄ 2 / 1 ►
Diervilla lonicera
Populus tremuloides shrub
Gaultheria hispidula
◄ 1 / 0 ►
ES 15
ES 16
ES 17
ES 18
ES 19
ES 20
ES 21
Tolerant Hardwoods
Red and White Pine

Vegetation Type Key (Common Names)

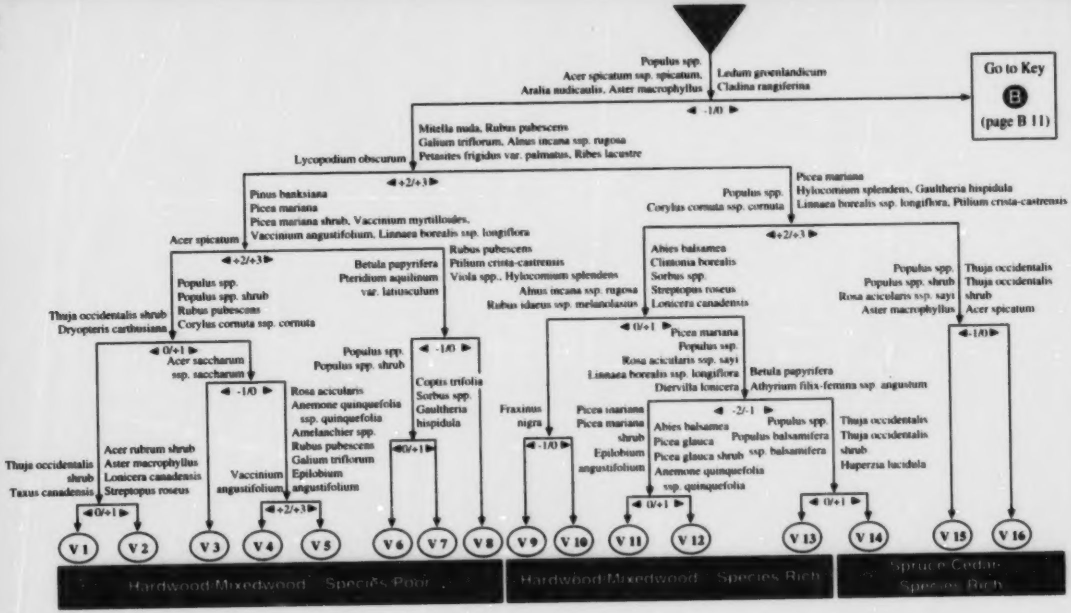


Go to Key B (page B 9)
Poplar
Mountain maple, Sarsaparilla
Large-leaved aster
Labrador-tea
Reindeer lichen
◄ -1/0 ►
Naked mitrewort, Dwarf raspberry
Fragrant bed-straw, Speckled alder
Sweet coltsfoot, Bristly black currant
Ground pine
◄ +2/+3 ►
Black spruce
Stair-step moss, Creeping snowberry
Twinflower, Plume moss
Poplar
Beaked hazel
◄ +2/+3 ►
Jack pine
Black spruce
Black spruce shrub
Velvet-leaf blueberry, Early low blueberry, Twinflower
Mountain maple
◄ +2/+3 ►
Poplar
Poplar shrub
Dwarf raspberry
Beaked hazel
White cedar shrub
Spinulose shield fern
◄ 0/+1 ►
Sugar maple
◄ -1/0 ►
White cedar shrub
Ground hemlock
Red maple shrub
Large-leaved aster
Canada honeysuckle
Rose twisted-stalk
◄ 0/+1 ►
Early low blueberry
Bristly wild rose
Wood anemone
Serviceberries
Dwarf raspberry
Fragrant bedstraw
Fireweed
◄ +2/+3 ►
White birch
Bracken fern
Dwarf raspberry
Plume moss
Violets
Stair-step moss
◄ -1/0 ►
Poplar
Poplar shrub
Goldthread
Mountain ashes
Creeping snowberry
◄ 0/+1 ►
Balsam fir
Blue bead lily
Mountain ashes
Rose twisted-stalk
Canada honeysuckle
Speckled alder
Wild red raspberry
◄ 0/+1 ►
Black spruce
Poplar
Bristly wild rose, Twinflower
Bush honeysuckle
White birch
Northern lady fern
◄ -2/-1 ►
Black ash
◄ -1/0 ►
Black spruce
Black spruce shrub
Fireweed
Balsam fir
White spruce
White spruce shrub
Wood anemone
◄ 0/+1 ►
Poplar
Balsam poplar
White cedar
White cedar shrub
Shining clubmoss
◄ 0/+1 ►
Poplar
Poplar shrub
Bristly wild rose
Large-leaved aster
White cedar
White cedar shrub
Mountain maple
◄ -1/0 ►
V 1
V 2
V 3
V 4
V 5
V 6
V 7
V 8
V 9
V 10
V 11
V 12
V 13
V 14
V 15
V 16
Hardwood/Mixedwood - Species Poor
Hardwood/Mixedwood - Species Rich
Spruce Cedar - Species Rich

...Vegetation Type Key (Common Names)

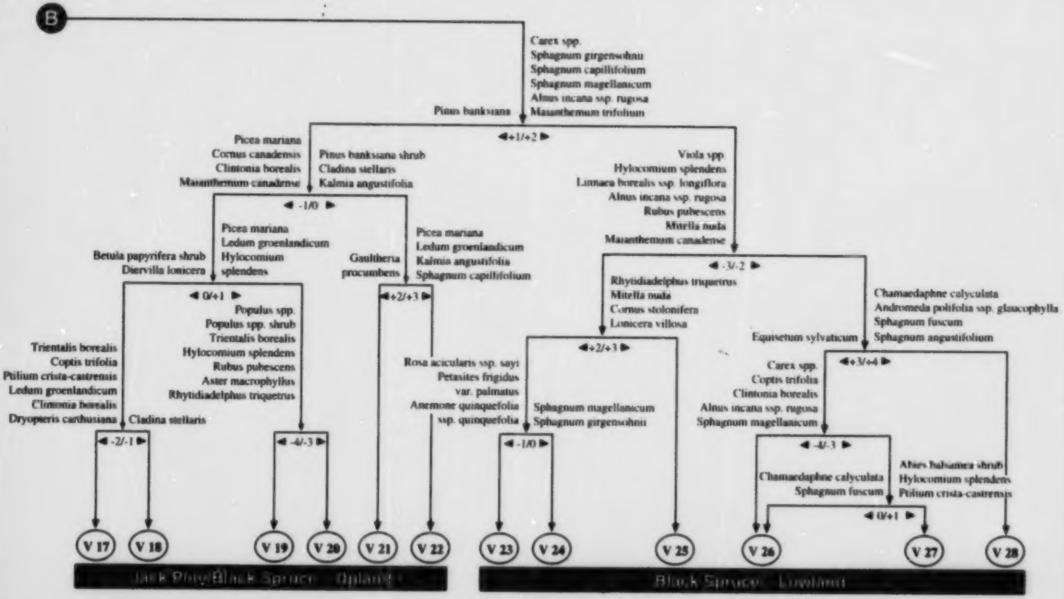

B
Sedges
Common green peat moss
Lady's tresses peat moss
Red fat-leaved peat moss
Speckled alder
Three-leaved smilacina
Jack pine
◄+1/+2►
Black spruce
Bunchberry
Blue bead lily
Wild lily-of-the-valley
Jack pine shrub
Coral lichen
Sheep laurel
◄-1/0►
White birch shrub
Bush honeysuckle
Black spruce
Labrador-tea
Stair-step moss
◄0/+1►
Starflower
Goldthread
Plume moss
Labrador-tea
Blue bead lily
Spinulose shield fern
Coral lichen
◄-2/-1►
Poplar
Poplar shrub
Starflower
Stair-step moss
Dwarf raspberry
Large-leaved aster
Electrified cat-tail moss
◄-4/-3►
Wintergreen
Black spruce
Labrador-tea
Sheep laurel
Lady's tresses peat moss
◄+2/+3►
Violets
Stair-step moss
Twinflower
Speckled alder
Dwarf raspberry
Naked mitrewort
Wild lily-of-the-valley
◄-3/-2►
Electrified cat-tail moss
Naked mitrewort
Red-osier dogwood
Northern honeysuckle
◄+2/+3►
Bristly wild rose
Sweet coltsfoot
Wood anemone
Red fat-leaved peat moss
Common green peat moss
◄-1/0►
Woodland horsetail
Leatherleaf
Bog rosemary
Brown bog peat moss
Yellow two-leaved peat moss
◄+3/+4►
Sedges
Goldthread
Blue bead lily
Speckled alder
Red fat-leaved peat moss
◄-4/-3►
Leatherleaf
Brown bog peat moss
Balsam fir shrub
Stair-step moss
Plume moss
◄0/+1►
V 17
V 18
V 19
V 20
V 21
V 22
V 23
V 24
V 25
V 26
V 27
V 28
Jack Pine/Black Spruce – Upland
Black Spruce – Lowland

Vegetation Type Key
(Latin Names)

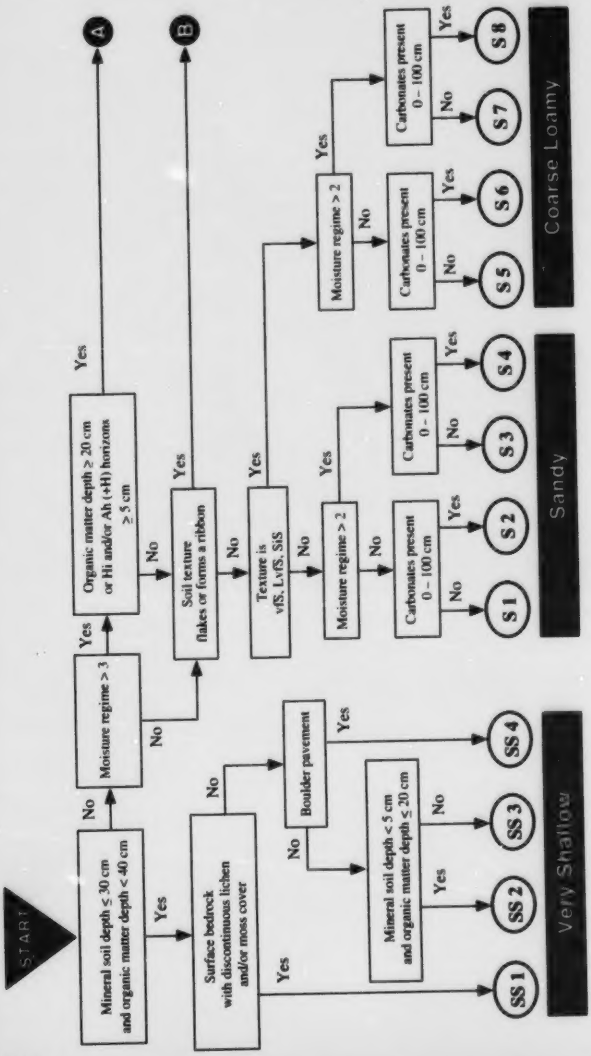


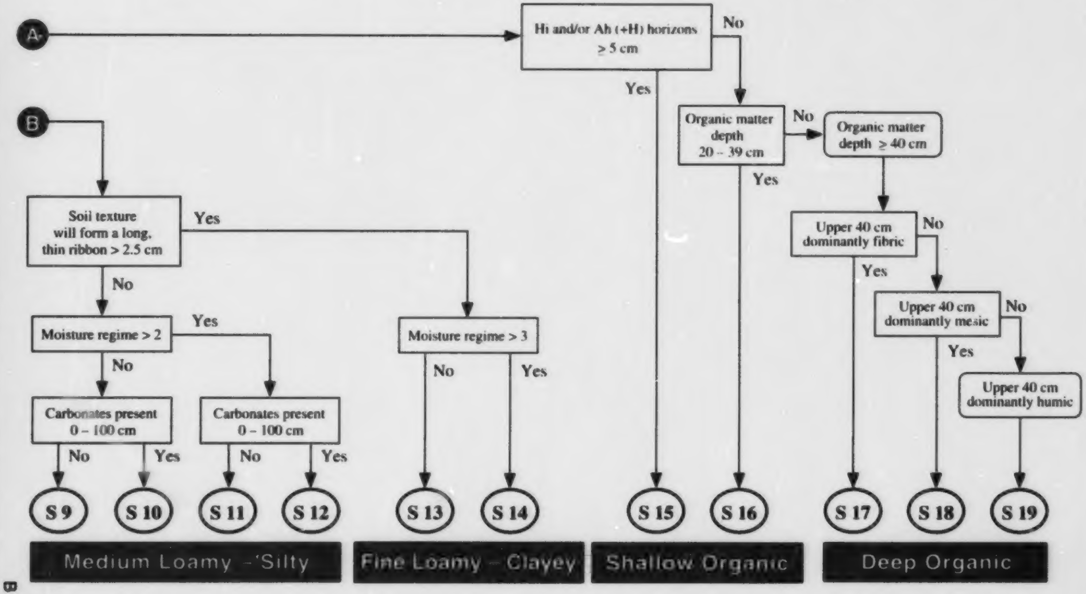
Populus spp.
Acer spicatum ssp. spicatum,
Aralia nudicaulis, Aster macrophyllus
Ledum groenlandicum
Cladina rangiferina
◄ -1/0 ►
Go to Key
B
(page B 11)
Mitella nuda, Rubus pubescens
Galium triflorum, Alnus incana ssp. rugosa
Petasites frigidus var. palmatus, Ribes lacustre
Lycopodium obscurum
◄+2/+3►
Picea mariana
Hylocomium splendens, Gaultheria hispidula
Linnaea borealis ssp. longiflora, Ptilium crista-castrensis
Populus spp.
Corylus cornuta ssp. cornuta
Pinus banksiana
Picea mariana
Picea mariana shrub, Vaccinium myrtilloides,
Vaccinium angustifolium, Linnaea borealis ssp. longiflora
Acer spicatum
◄+2/+3►
Populus spp.
Populus spp. shrub
Rubus pubescens
Corylus cornuta ssp. cornuta
Betula papyrifera
Pteridium aquilinum
var. latiusculum
Rubus pubescens
Ptilium crista-castrensis
Viola spp., Hylocomium splendens
Alnus incana ssp. rugosa
Rubus idaeus ssp. melanolasius
◄+2/+3►
Abies balsamea
Clintonia borealis
Sorbus spp.
Streptopus roseus
Lonicera canadensis
Populus spp.
Populus spp. shrub
Rosa acicularis ssp. sayi
Aster macrophyllus
Thuja occidentalis
Thuja occidentalis
shrub
Acer spicatum
◄-1/0►
Thuja occidentalis shrub
Dryopteris carthusiana
◄ 0/+1 ►
Acer saccharum
ssp. saccharum
◄ -1/0 ►
Rosa acicularis
Anemone quinquefolia
ssp. quinquefolia
Amelanchier spp.
Rubus pubescens
Galium triflorum
Epilobium
angustifolium
Vaccinium
angustifolium
◄+2/+3►
Thuja occidentalis
shrub
Taxus canadensis
Acer rubrum shrub
Aster macrophyllus
Lonicera canadensis
Streptopus roseus
◄0/+1►
Populus spp.
Populus spp. shrub
◄ -1/0 ►
Coptis trifolia
Sorbus spp.
Gaultheria
hispidula
◄0/+1►
◄ 0/+1 ►
Picea mariana
Populus ssp.
Rosa acicularis ssp. sayi
Linnaea borealis ssp. longiflora
Diervilla lonicera
Betula papyrifera
Athyrium filix-femina ssp. angustum
Fraxinus
nigra
◄ -1/0 ►
Picea mariana
Picea mariana
shrub
Epilobium
angustifolium
◄ -2/-1 ►
Abies balsamea
Picea glauca
Picea glauca shrub
Anemone quinquefolia
ssp. quinquefolia
Populus spp.
Populus balsamifera
ssp. balsamifera
Thuja occidentalis
Thuja occidentalis
shrub
Huperzia lucidula
◄ 0/+1 ►
◄ 0/+1 ►
V 1
V 2
V 3
V 4
V 5
V 6
V 7
V 8
V 9
V 10
V 11
V 12
V 13
V 14
V 15
V 16
Hardwood-Mixedwood – Species Poor
Hardwood-Mixedwood – Species Rich
Spruce-Cedar – Species Rich

...Vegetation Type Key (Latin Names)


B
Pinus banksiana
Carex spp.
Sphagnum girgensohnii
Sphagnum capillifolium
Sphagnum magellanicum
Alnus incana ssp. rugosa
Maianthemum trifolium
◄+1/+2►
Picea mariana
Cornus canadensis
Clintonia borealis
Maianthemum canadense
Pinus banksiana shrub
Cladina stellaris
Kalmia angustifolia
Viola spp.
Hylocomium splendens
Linnaea borealis ssp. longiflora
Alnus incana ssp. rugosa
Rubus pubescens
Mitella nuda
Maianthemum canadense
◄-1/0►
Betula papyrifera shrub
Diervilla lonicera
Picea mariana
Ledum groenlandicum
Hylocomium splendens
Gaultheria procumbens
Picea mariana
Ledum groenlandicum
Kalmia angustifolia
Sphagnum capillifolium
◄0/+1►
Trientalis borealis
Coptis trifolia
Ptilium crista-castrensis
Ledum groenlandicum
Clintonia borealis
Dryopteris carthusiana
Cladina stellaris
Populus spp.
Populus spp. shrub
Trientalis borealis
Hylocomium splendens
Rubus pubescens
Aster macrophyllus
Rhytidiadelphus triquetrus
◄+2/+3►
Rosa acicularis ssp. sayi
Petasites frigidus var. palmatus
Anemone quinquefolia ssp. quinquefolia
◄-2/-1►
◄-4/-3►
◄-3/-2►
Rhytidiadelphus triquetrus
Mitella nuda
Cornus stolonifera
Lonicera villosa
Equisetum sylvaticum
Chamaedaphne calyculata
Andromeda polifolia ssp. glaucophylla
Sphagnum fuscum
Sphagnum angustifolium
◄+2/+3►
Sphagnum magellanicum
Sphagnum girgensohnii
◄-1/0►
◄+3/+4►
Carex spp.
Coptis trifolia
Clintonia borealis
Alnus incana ssp. rugosa
Sphagnum magellanicum
◄-4/-3►
Chamaedaphne calyculata
Sphagnum fuscum
Abies balsamea shrub
Hylocomium splendens
Ptilium crista-castrensis
◄0/+1►
V 17
V 18
V 19
V 20
V 21
V 22
V 23
V 24
V 25
V 26
V 27
V 28
Jack Pine/Black Spruce – Upland
Black Spruce – Lowland

Soil Type Key


START
Mineral soil depth ≤ 30 cm and organic matter depth < 40 cm
No
Yes
Moisture regime > 3
Yes
No
Organic matter depth ≥ 20 cm or Hi and/or Ah (+H) horizons ≥ 5 cm
Yes
A
No
Soil texture flakes or forms a ribbon
Yes
B
No
Texture is vfS, LvfS, SiS
Yes
No
Moisture regime > 2
Yes
No
Carbonates present 0 – 100 cm
No
Yes
S1
S2
S3
S4
Sandy
Moisture regime > 2
Yes
No
Carbonates present 0 – 100 cm
No
Yes
S5
S6
S7
S8
Coarse Loamy
Surface bedrock with discontinuous lichen and/or moss cover
Yes
No
Boulder pavement
Yes
No
Mineral soil depth < 5 cm and organic matter depth ≤ 20 cm
Yes
No
SS1
SS2
SS3
SS4
Very Shallow


A
Hi and/or Ah (+H) horizons ≥ 5 cm
No
Yes
Organic matter depth 20 – 39 cm
No
Yes
Organic matter depth ≥ 40 cm
Upper 40 cm dominantly fibric
No
Yes
Upper 40 cm dominantly mesic
No
Yes
Upper 40 cm dominantly humic
B
Soil texture will form a long, thin ribbon > 2.5 cm
Yes
No
Moisture regime > 2
Yes
No
Carbonates present 0 – 100 cm
No
Yes
Carbonates present 0 – 100 cm
No
Yes
Moisture regime > 3
No
Yes
S 9
S 10
S 11
S 12
S 13
S 14
S 15
S 16
S 17
S 18
S 19
Medium Loamy – Silty
Fine Loamy – Clayey
Shallow Organic
Deep Organic

Introduction to Ecosites

This section contains ecosite fact sheets, species percentage by ecosite tables, photographs for each of the 29 ecosites, landscape associations, terrain types, and information about ecosite mapping concepts.

The ecosite fact sheets provide detailed information on the occurrence and abundance of plant species, and the distribution of soil and site features. Use these fact sheets to check the accuracy of ecosite determinations made using the ecosite key, and as reference material in developing applications.

The photographs show typical stand and site conditions for each ecosite. Use these photographs as a quick visual reference in comparing ecosites.

Changes in Nomenclature and Numbering

In order to be consistent with the new provincial naming conventions for the Ecological Land Classification program, the new term ecosite has been adopted to replace the term site type. The definition of what a site type was, and what an ecosite is, are the same.

When the data were analyzed to create the new ecosites, care was taken to ensure that the new ecosite could be directly related to the old site type and operational group numbers. For example, ES9p and ES9r contain communities that would have keyed out as ST9 in the 1994 edition of the FEC. In the present version, due to the increased sample size, the presence of the two different ecosites could be observed, which were distinct from both a management and statistical perspective. They occur at the same spatial scale as the old ST9, but now the two distinct communities that were within ST9 are recognized as separate ecosites. The number 9 was retained as part of the name to allow data and information to be tracked over time. An operational group 9 can be traced to ST9, and ST9 to either ES9p or ES9r.

Since the previous version of the FEC there has also been a change in the ecosite (site type) modifiers. In the past, a, b and c subscripts were used to indicate a gradient of increasingly coarse soil textures among site types with the same number. These have been changed to letters of the alphabet which are easier to relate to the feature of the ecosite that is being highlighted:

Soil texture subscripts

f = fine soil

m = medium soil

c = coarse soil

Vegetation species richness subscripts

p = species poor

r = species rich

This change will make the nature of the individual ecosites more intuitively obvious.

Ecosite Names

Ecosites of Northeastern Ontario

ES 1p	Black Spruce – Jack Pine – Very Shallow Soil – Species Poor
ES 1r	White Spruce – White Birch – Very Shallow Soil – Species Rich
ES 2	Jack Pine – Coarse Soil
ES 3	White Birch – Trembling Aspen – Black Spruce – Coarse Soil
ES 4	Black Spruce – Jack Pine – Coarse Soil
ES 5f	Black Spruce – Fine Soil
ES 5m	Black Spruce – Medium Soil
ES 6f	Black Spruce – Trembling Aspen – Fine Soil
ES 6m	Trembling Aspen – Black Spruce – Balsam Fir – Medium Soil
ES 6c	Trembling Aspen – Black Spruce – Jack Pine – Coarse Soil
ES 7f	Trembling Aspen – White Spruce – White Birch – Fine Soil
ES 7m	Trembling Aspen – White Birch – Medium Soil
ES 7c	Trembling Aspen – White Birch – Coarse Soil
ES 8	Black Spruce – Feathermoss – Sphagnum – Moist Soil
ES 9p	Black Spruce – Larch – Moist Soil – Species Poor
ES 9r	White Spruce – Balsam Fir – White Cedar – Moist Soil – Species Rich
ES 10	Trembling Aspen – Black Spruce – Balsam Poplar – Moist Soil
ES 11	Black Spruce – Labrador-tea – Organic Soil
ES 12	Black Spruce – Larch – Labrador-tea – Organic Soil
ES 13p	Black Spruce – Larch – Speckled Alder – Organic Soil – Species Poor
ES 13r	White Cedar – Black Spruce – Organic Soil – Species Rich

...Ecosite Names

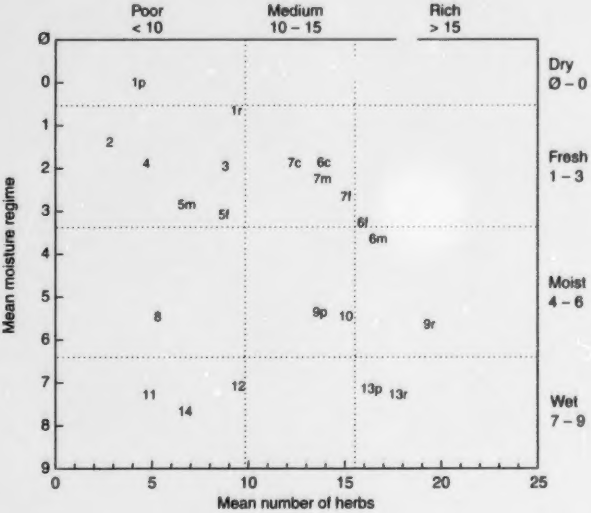
ES 14	Black Spruce – Leatherleaf – Organic Soil
ES 15	Red Maple
ES 16	Yellow Birch
ES 17	Sugar Maple
ES 18	Jack Pine – White Pine – Red Pine
ES 19	White Pine – Red Pine – Mixedwood
ES 20	White Pine – Hardwood Mixedwood
ES 21	White Pine – Coniferous Mixedwood

Ecosite Diagrams

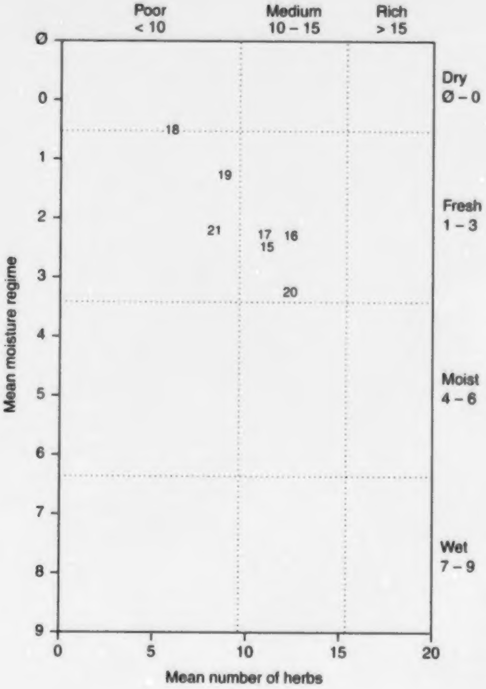
The ecosite diagram plots average values for each ecosite on axes of soil moisture regime and the number of herb species. Each ecosite occurs across a range of values for moisture regime and for the number of herb species. These ranges are not shown on the diagram. Only the average (or "modal") condition is shown for each ecosite.

The purpose of the ecosite diagram is to provide a simple, two-dimensional framework for displaying interpretive material that can be related to the ecosites. Separate diagrams are provided for ES1 to ES14 and ES15 to ES21.

Ecosites 1 to 14



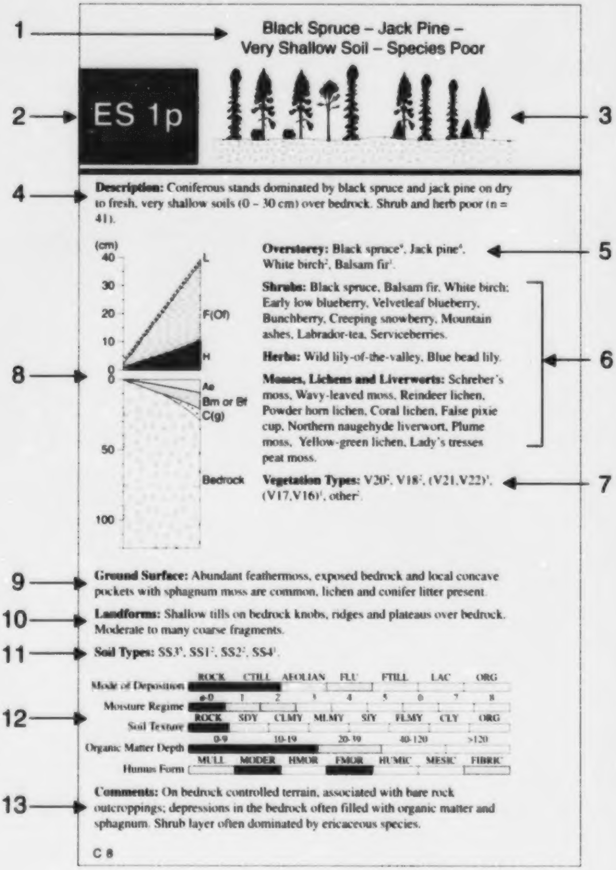
Ecosites 15 to 21



Ecosite Fact Sheet Explanation

1. **Ecosite Name:** a name chosen to highlight the distinctive vegetation and soil features of an ecosite.
2. **Ecosite Number:** provides a quick reference. Ecosites with the same number have similar characteristics. The f, m and c subscripts indicate a gradient of increasingly coarse soil (f = fine soil, m = medium soil, c = coarse soil). The p and r subscripts indicate a gradient of increasing richness (p = species poor, r = species rich).
3. **Stand Structure Silhouette:** a representation of the composition and structure of a typical ecosite cross section.
4. **Description:** a general text description indicating the dominant overstorey, understorey and soil characteristics. Sample sizes are shown in brackets.
5. **Overstorey:** a listing of the tree species, ranked by frequency of occurrence in the sample (e.g. black spruce^7 indicates that black spruce occurred in 70 percent of the samples).
6. **Understorey (Shrubs, Herbs, Mosses, Lichens and Liverworts):** a listing of the shrubs, herbs, mosses, lichens and liverworts in descending order of frequency. Tree shrubs are separated from other shrubs by a semi-colon. All the species listed occurred on more than 40 percent of the plots. Herbs include ferns, fern allies, grasses and sedges.
7. **Vegetation Types:** a listing of the vegetation types, ranked by frequency of occurrence in the sample (e.g. V2^8 indicates that vegetation type 2 occurred in 80 percent of the samples).
8. **Soil Profile:** a cross sectional diagram, showing the typical sequence of horizons and their range in thickness. Note that the scale used for the forest floor is larger than that used for the mineral soil.
9. **Ground Surface:** a general description of surface materials, microtopography, and typical materials of the forest floor.
10. **Landforms:** a listing of the landforms upon which the ecosites commonly occur.
11. **Soil Types:** a listing of the soil types, ranked by frequency of occurrence in the sample (e.g. S1^7 indicates that soil type S1 occurred in 70 percent of the samples).
12. **Soil Feature Histograms (Moisture Regime, Soil Texture, Organic Matter Depth, Humus Form and Mode of Deposition):** a visual representation of the frequency of occurrence in the sample, of these soil features. Darker = more frequent.
13. **Comments:** a description of additional characteristics or unique features.

...Ecosite Fact Sheet Explanation


1
2
3
4
5
6
7
8
9
10
11
12
13
ES 1p
(cm)
40
30
20
10
0
0
50
100
L
F(Of)
H
Ae
Bm or Bf
C(g)
Bedrock
Mode of Deposition
ROCK
CTILL
AEOLIAN
FLU
FTILL
LAC
ORG
Moisture Regime
0-0
1
2
3
4
5
6
7
8
Soil Texture
ROCK
SDY
CLMY
MLMY
SIY
FLMY
CLY
ORG
Organic Matter Depth
0-9
10-19
20-39
40-120
>120
Humus Form
MULL
MODER
HMOR
FMOR
HUMIC
MESIC
FIBRIC

Black Spruce – Jack Pine –
Very Shallow Soil – Species Poor

Description: Coniferous stands dominated by black spruce and jack pine on dry to fresh, very shallow soils (0 – 30 cm) over bedrock. Shrub and herb poor (n = 41).

Overstorey: Black spruce^{4}, Jack pine^{4}, White birch^{2}, Balsam fir^{1}.

Shrubs: Black spruce, Balsam fir, White birch; Early low blueberry, Velvetleaf blueberry, Bunchberry, Creeping snowberry, Mountain ashes, Labrador-tea, Serviceberries.

Herbs: Wild lily-of-the-valley, Blue bead lily.

Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Reindeer lichen, Powder horn lichen, Coral lichen, False pixie cup, Northern naugehyde liverwort, Plume moss, Yellow-green lichen, Lady's tresses peat moss.

Vegetation Types: V20^{2}, V18^{2}, (V21,V22)^{1}, (V17,V16)^{1}, other^{2}.

Ground Surface: Abundant feathermoss, exposed bedrock and local concave pockets with sphagnum moss are common, lichen and conifer litter present.

Landforms: Shallow tills on bedrock knobs, ridges and plateaus over bedrock. Moderate to many coarse fragments.

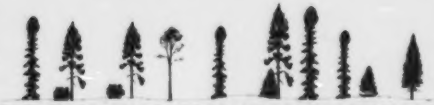
Soil Types: SS3^{5}, SS1^{2}, SS2^{2}, SS4^{1}.

Comments: On bedrock controlled terrain, associated with bare rock outcroppings; depressions in the bedrock often filled with organic matter and sphagnum. Shrub layer often dominated by ericaceous species.

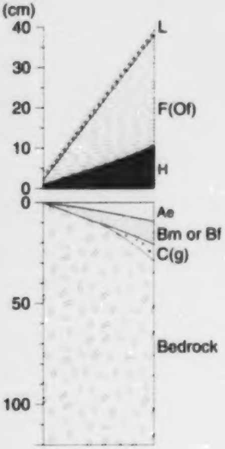
C 8

Black Spruce – Jack Pine – Very Shallow Soil – Species Poor

ES 1p



Description: Coniferous stands dominated by black spruce and jack pine on dry to fresh, very shallow soils (0 – 30 cm) over bedrock. Shrub and herb poor (n = 41).



Overstorey: Black spruce[9], Jack pine[4], White birch[2], Balsam fir[1].

Shrubs: Black spruce, Balsam fir, White birch; Early low blueberry, Velvetleaf blueberry, Bunchberry, Creeping snowberry, Mountain ashes, Labrador-tea, Serviceberries.

Herbs: Wild lily-of-the-valley, Blue bead lily.

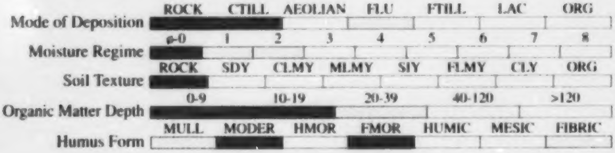
Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Reindeer lichen, Powder horn lichen, Coral lichen, False pixie cup lichen, Northern naugehyde liverwort, Plume moss, Yellow-green lichen, Lady's tresses peat moss.

Vegetation Types: V20[2], V18[2], (V21, V22)[1], (V17, V16)[1], other[2].

Ground Surface: Abundant feathermoss, exposed bedrock and local concave pockets with sphagnum moss are common, lichen and conifer litter present.

Landforms: Shallow tills on bedrock knobs, ridges and plateaus over bedrock. Moderate to many coarse fragments.

Soil Types: SS3[5], SS1[2], SS2[2], SS4[1].

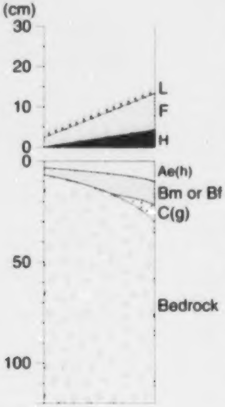


Comments: On bedrock controlled terrain, associated with bare rock outcroppings. Depressions in the bedrock often filled with organic matter and sphagnum. Shrub layer often dominated by ericaceous species.

White Spruce – White Birch – Very Shallow Soil – Species Rich

ES 1r

Description: Mixedwood dominated by white spruce and white birch on dry to fresh, very shallow soils (0 – 30 cm) over bedrock. Medium number of shrubs, herb poor (n = 14).



Overstorey: White spruce^{9}, White birch^{9}, Balsam fir^{4}, Jack pine^{3}, Trembling aspen^{3}, Black spruce^{2}, Black ash^{1}.

Shrubs: White spruce, Balsam fir, White birch, Black spruce; Early low blueberry, Bunchberry, Mountain maple, Bush honeysuckle, Mountain ashes, Green alder, Serviceberries, Velvetleaf blueberry, Beaked hazel, Twinflower.

Herbs: Blue bead lily, Wild lily-of-the-valley, Sarsaparilla, Starflower, Large-leaved aster, Goldthread, Spinulose shield fern, Bracken fern, Violets.

Mosses, Lichens and Liverworts: Schreber's moss, Reindeer lichen, Wavy-leaved moss, Curly heron's bill moss, Ragged moss.

Vegetation Types: V2^{3}, V1^{1}, V6^{1}, V7^{1}, V17^{1}, (V4, V8, V12)^{3}.

Ground Surface: Feathermoss, lichen, fallen logs and stones present. Broad leaved and conifer litter abundant.

Landforms: Shallow tills on bedrock knobs, ridges and plateaus over bedrock. Many coarse fragments.

Soil Types: SS3^{8}, SS1^{1}, SS4^{1}.

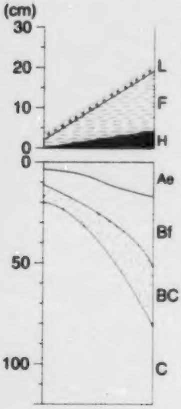
	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG		
Mode of Deposition	■								
	0-0	1	2	3	4	5	6	7	8
Moisture Regime	■		■						
	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG	
Soil Texture	■								
	0-9	10-19	20-39	40-120	>120				
Organic Matter Depth	■	■							
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC		
Humus Form		■		■					

Comments: On bedrock controlled terrain and rock outcroppings. Shrub component is often broad leaved. Less sphagnum, feathermoss, ericaceous shrubs and lichens and more broad leaved and conifer litter than ES1p.

Jack Pine – Coarse Soil

ES 2

Description: Jack pine stands on deep, dry to fresh, sandy to coarse loamy soils. Shrub and herb poor with abundant ericaceous shrubs, feathermoss and lichens (n = 51).



Overstorey: Jack pine^{10}, Black spruce^{2}.

Shrubs: Black spruce, Jack pine, Balsam fir; Early low blueberry, Velvetleaf blueberry, Twinflower, Wintergreen, Trailing arbutus, Sheep laurel, Bunchberry, Creeping snowberry, Serviceberries.

Herbs: Wild lily-of-the-valley.

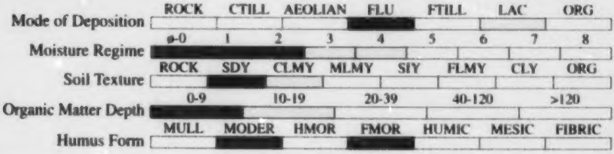
Mosses, Lichens and Liverworts: Schreber's moss, Reindeer lichen, Wavy-leaved moss, Coral lichen, Plume moss.

Vegetation Types: V21^{7}, V18^{2}, (V17, V20)^{1}.

Ground Surface: Usually a continuous carpet of feathermoss with patches of lichen common.

Landforms: Outwash plains, deltas, eskers, esker complexes (sometimes with aeolian caps), sand dunes, kames and beaches. Few coarse fragments.

Soil Types: S1^{7}, S3^{1}, S2^{1}, (S5, S16, S6, S7, S4)^{1}.

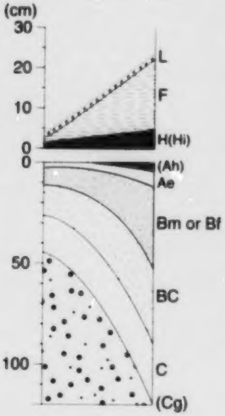


Comments: Black spruce and ericaceous shrubs abundant in understorey.

White Birch – Trembling Aspen – Black Spruce – Coarse Soil

ES 3

Description: Mixedwood stands dominated by white birch, trembling aspen and black spruce on dry to moist sandy to coarse loamy soils. Medium number of shrubs, herb poor with abundant bunchberry (n = 75).



Overstorey: White birch^{8}, Trembling aspen^{7}, Black spruce^{6}, White spruce^{4}, Jack pine^{4}, Balsam fir^{2}.

Shrubs: Balsam fir, Black spruce, White birch, Trembling aspen, White spruce; Bunchberry, Early low blueberry, Bush honeysuckle, Velvetleaf blueberry, Twinflower, Mountain maple, Mountain ashes, Beaked hazel, Creeping snowberry.

Herbs: Wild lily-of-the-valley, Blue bead lily, Sarsaparilla, Starflower, Goldthread, Large-leaved aster, Bracken fern, Ground pine.

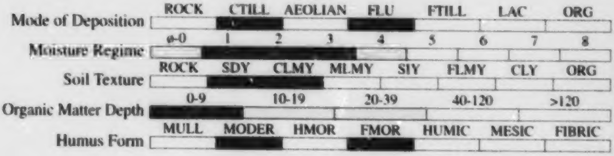
Mosses, Lichens and Liverworts: Schreber's moss, Curly heron's bill moss, Wavy-leaved moss, Plume moss.

Vegetation Types: V8^{5}, V6^{2}, V7^{2}, other^{1}.

Ground Surface: Deciduous litter common with patches of moss and lichen common.

Landforms: On outwash, deltas, eskers, esker/kame complexes, ablation till, ground moraine, end moraine; sometimes on stratified soils, often along boundaries between landforms. Few to many coarse fragments.

Soil Types: S1^{4}, S5^{2}, S7^{2}, S3^{1}, (S8, S2, S15)^{1}.

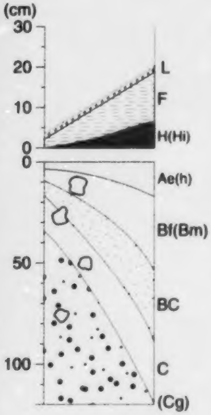


Comments: Balsam fir shrubs and broad leaved shrubs common in understorey. Largetooth aspen on one percent of this ecosite.

Black Spruce – Jack Pine – Coarse Soil

ES 4

Description: Conifer stands dominated by black spruce and jack pine on dry to moist sandy to coarse loamy soils. Medium number of shrubs, herb poor (n = 116).



Overstorey: Black spruce^{9}, Jack pine^{8}, White birch^{1}, Balsam fir^{1}.

Shrubs: Black spruce, Balsam fir; Early low blueberry, Bunchberry, Velvetleaf blueberry, Creeping snowberry, Twinflower, Labrador-tea, Trailing arbutus, Bush honeysuckle, Serviceberries, Sheep laurel.

Herbs: Wild lily-of-the-valley, Blue bead lily, Goldthread.

Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Reindeer lichen, Plume moss, Curly heron's bill moss.

Vegetation Types: V20^{5}, V17^{2}, V18^{1}, (V22, V7)^{1}, other^{1}.

Ground Surface: Abundant feathermoss and conifer litter; ericaceous shrubs common; sparse sphagnum.

Landforms: Outwash plains, deltas, eskers, kames, esker/kame complexes, sand dunes and beaches, usually in lower slope positions. Few to moderate coarse fragments.

Soil Types: S1^{4}, S5^{2}, S3^{2}, S7^{1}, (S2, S6, S4, S8, S15)^{1}.

	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG
Mode of Deposition				■			

	0-0	1	2	3	4	5	6	7	8
Moisture Regime	■	■	■						

	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG
Soil Texture		■	■					

	0-9	10-19	20-39	40-120	>120
Organic Matter Depth	■	■			

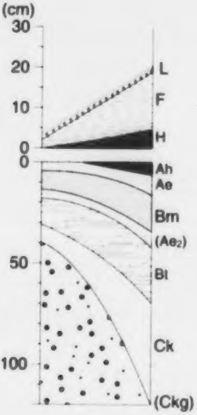
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC
Humus Form		■		■			

Comments: Black spruce shrubs common in understorey.

Black Spruce –
Fine Soil

ES 5f

Description: Conifer stands dominated by black spruce on fresh to moist, fine loamy to clayey soils. Shrub and herb poor, with abundant feathermoss (n = 35).



Overstorey: Black spruce^{10}, Balsam fir^{2}, Jack pine^{2}, White birch^{1}, Balsam poplar^{1}.

Shrubs: Jack pine, Balsam fir; Creeping snowberry, Bunchberry, Twinflower, Velvetleaf blueberry, Labrador-tea, Early low blueberry, Dwarf raspberry, Bristly wild rose.

Herbs: Goldthread, Wild lily-of-the-valley, Sweet coltsfoot, Blue bead lily, Woodland horsetail.

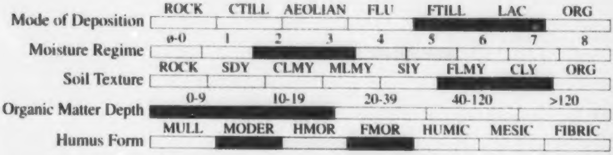
Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Stair-step moss, Wavy-leaved moss, Reindeer lichen, Lady's tresses peat moss, Curly heron's bill moss, False pixie cup, Powder horn lichen.

Vegetation Types: V23^{3}, V24^{2}, V20^{1}, V15^{1}, (V8, V16, V22, V26)^{1}, other^{1}.

Ground Surface: Usually a continuous carpet of feathermoss with pockets of sphagnum abundant and patches of conifer litter.

Landforms: Glaciolacustrine or clay till plains, and undulating drumlinoid formations. Few coarse fragments.

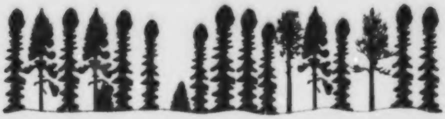
Soil Types: S14^{5}, S13^{4}, (S15, S16)^{1}.



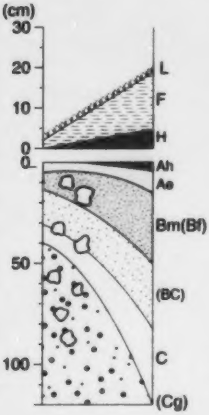
Comments: Found mainly in the Clay Belt. Free carbonates common within 100 cm of soil surface. Black spruce shrubs common in understorey.

Black Spruce – Medium Soil

ES 5m



Description: Conifer mixedwood stands dominated by black spruce, on fresh to moderately moist, medium loamy to silty soils. Shrub and herb poor with abundant feathermoss (n = 26).



Overstorey: Black spruce^{10}, Jack pine^{5}, Trembling aspen^{2}, Balsam poplar^{2}.

Shrubs: Black spruce, Balsam fir; Bunchberry, Creeping snowberry, Velvetleaf blueberry, Twinflower, Early low blueberry, Labrador-tea, Serviceberries, Bush honeysuckle, Mountain ashes.

Herbs: Wild lily-of-the-valley, Blue bead lily, Large-leaved aster, Sarsaparilla, Goldthread, Starflower.

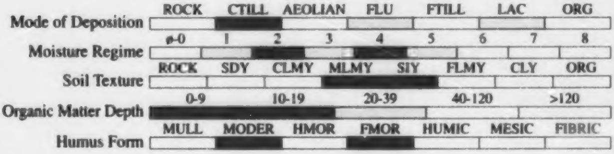
Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Curly heron's bill moss, Plume moss, Reindeer lichen, Stair-step moss.

Vegetation Types: V20^{3}, V27^{2}, V8^{1}, V17^{1}, V19^{1}, other^{2}.

Ground Surface: Usually a continuous carpet of feathermoss with patches of conifer litter; sparse sphagnum.

Landforms: Ground moraine, ablation till, end moraine and silty glaciolacustrine deposits. Moderate to many coarse fragments.

Soil Types: S9^{3}, S12^{3}, (S10, S11)^{3}, (S16, S15)^{1}.

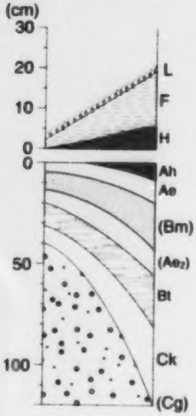


Comments: Black spruce shrubs common in understorey. Free carbonates commonly present within 100 cm of soil surface.

Black Spruce – Trembling Aspen – Fine Soil

ES 6f

Description: Mixedwood stands on fresh to moist, fine loamy to clayey soils. Medium number of shrubs, herb rich (n = 90).



Overstorey: Black spruce^{8}, Trembling aspen^{6}, Balsam fir^{4}, White spruce^{3}, Balsam poplar^{2}, White birch^{1}.

Shrubs: Balsam fir, Black spruce, Trembling aspen; Bunchberry, Dwarf raspberry, Twinflower, Bristly wild rose, Mountain ashes, Bush honeysuckle, Swamp red currant, Speckled alder, Serviceberries, Canada honeysuckle, Bristly black currant, Early low blueberry.

Herbs: Wild lily-of-the-valley, Sarsaparilla, Naked mitrewort, Violets, Fragrant bedstraw, Large-leaved aster, Blue bead lily, Sweet coltsfoot, Starflower, Wood anemone, Goldthread, Sedges, Woodland horsetail, Wild strawberry, Rose twisted-stalk, Shining clubmoss.

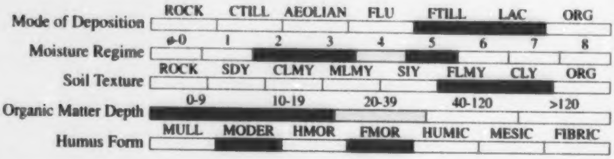
Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Stair-step moss, Electrified cat-tail moss, Wavy-leaved moss, Powder horn lichen, False pixie cup, Curly heron's bill moss.

Vegetation Types: V15^{4}, V10^{1}, V11^{1}, V12^{1}, V8^{1}, (V16, V23)^{1}, other^{1}.

Ground Surface: Varying proportions of deciduous and coniferous litter, and feathermoss.

Landforms: Glaciolacustrine or clay till plains, and undulating drumlinoid formations. Few coarse fragments.

Soil Types: S13^{5}, S14^{4}, (S15, S16)^{1}.

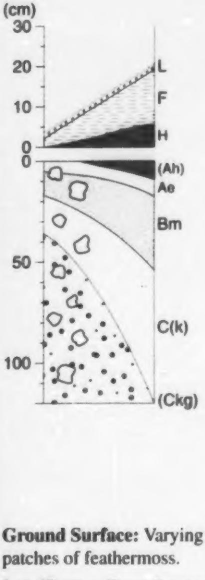


Comments: Balsam fir shrubs abundant and broad leaved shrubs common in understorey. Found mainly in the Clay Belt, with free carbonates common within 100 cm of soil surface.

ES 6m

Trembling Aspen – Black Spruce – Balsam Fir – Medium Soil

Description: Mixedwood stands on fresh to moderately moist, medium loamy to silty soils. Medium number of shrubs, herb rich (n = 24).



Overstorey: Trembling aspen^{7}, Black spruce^{6}, Balsam fir^{5}, Jack pine^{3}, White spruce^{2}, Balsam poplar^{2}, White birch^{2}.

Shrubs: Balsam fir, Trembling aspen; Bunchberry, Twinflower, Dwarf raspberry, Speckled alder, Serviceberries, Bush honeysuckle, Velvetleaf blueberry, Red raspberry, Mountain ashes, Early low blueberry, Beaked hazel, Creeping snowberry.

Herbs: Wild lily-of-the-valley, Blue bead lily, Large-leaved aster, Violets, Sarsaparilla, Wood anemone, Fragrant bedstraw, Naked mitrewort, Rose twisted-stalk, Goldthread, Sweet coltsfoot, Starflower, Sedges, Wild strawberry, Canada blue-joint.

Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Stair-step moss, Wavy-leaved moss, *Brachythecium* spp., Curly heron's bill moss, Electrified cat-tail moss.

Vegetation Types: V8^{2}, V10^{2}, V15^{2}, (V11, V13, V19, V23)^{3}, other^{1}.

Ground Surface: Varying proportions of deciduous and coniferous litter, with patches of feathermoss.

Landforms: Ground moraine, ablation till, end moraine, silty glaciolacustrine or alluvial (riverine) deposits. Few coarse fragments.

Soil Types: S12^{3}, S10^{3}, S11^{1}, S16^{1}, S15^{1}, S9^{1}.

	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG
Mode of Deposition		■		■		■	

	0-0	1	2	3	4	5	6	7	8
Moisture Regime			■	■	■				

	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG
Soil Texture				■	■			

	0-9	10-19	20-39	40-120	>120
Organic Matter Depth	■	■			

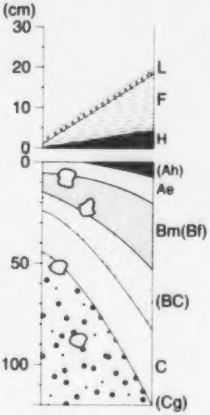
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC
Humus Form		■		■			

Comments: Free carbonates commonly present within 100 cm of soil surface.

Trembling Aspen – Black Spruce – Jack Pine – Coarse Soil

ES 6c

Description: Hardwood mixedwood stands on dry to moderately moist, sandy to coarse loamy soils. Medium number of shrubs and herbs (n = 49).



Overstorey: Trembling aspen^7, Black spruce^6, Jack pine^6, Balsam fir^4, White spruce^4, White birch^2.

Shrubs: Balsam fir, Black spruce, Trembling aspen, White birch, White spruce; Bunchberry, Twinflower, Bush honeysuckle, Early low blueberry, Dwarf raspberry, Serviceberries, Velvetleaf blueberry, Bristly wild rose, Beaked hazel, Mountain ashes.

Herbs: Wild lily-of-the-valley, Blue bead lily, Sarsaparilla, Starflower, Large-leaved aster, Violets, Wood anemone, Goldthread, Rose twisted-stalk, Ground pine, Running clubmoss.

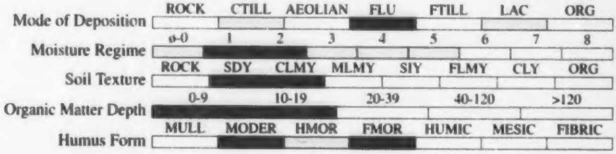
Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Wavy-leaved moss, Curly heron's bill moss, Stair-step moss, Electrified cat-tail moss.

Vegetation Types: V8^7, V4^1, V15^1, other^1.

Ground Surface: Varying proportions of deciduous and coniferous litter, with patches of feathermoss.

Landforms: Outwash plains, eskers, kames, esker/kame complexes, beaches, end moraines, ablation till and ground moraines. Moderate to many coarse fragments.

Soil Types: S2^4, S5^1, S1^1, S3^1, S6^1, S8^1, (S4, S7)^1.

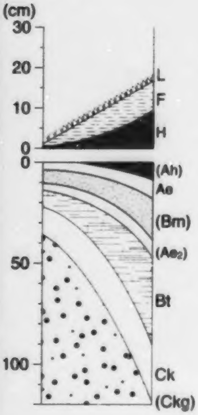


Comments: Balsam fir shrubs present in understorey of many stands. Broad leaved shrubs often found in understorey. Balsam poplar occurs less often than in ES6f and ES6m. Free carbonates common within 100 cm of soil surface.

Trembling Aspen – White Spruce – White Birch – Fine Soil

ES 7f

Description: Hardwood mixedwood stands on fresh to moist, fine loamy to clayey soils. Medium number of shrubs, herb rich with abundant tall woody shrubs (n = 69).



Overstorey: Trembling aspen^{7}, White spruce^{5}, White birch^{4}, Balsam fir^{4}, Balsam poplar^{2}, Black spruce^{1}.

Shrubs: Balsam fir, Trembling aspen, White birch; Dwarf raspberry, Mountain maple, Bunchberry, Beaked hazel, Canada honeysuckle, Mountain ashes, Bush honeysuckle, Bristly black currant, Squashberry, Bristly wild rose.

Herbs: Sarsaparilla, Blue bead lily, Large-leaved aster, Violets, Wild lily-of-the-valley, Rose twisted-stalk, Naked mitrewort, Starflower, Fragrant bedstraw, Wood anemone, Sedges, Oak fern.

Mosses, Lichens and Liverworts: Schreber's moss, Electrified cat-tail moss.

Vegetation Types: V13^{3}, V12^{2}, V5^{2}, V4^{1}, V10^{1}, other^{1}.

Ground Surface: Abundant deciduous litter with feathermoss and conifer litter present.

Landforms: Glaciolacustrine or clay till plains, undulating drumlinoid formations. Few coarse fragments.

Soil Types: S13^{6}, S14^{3}, (S15, S16)^{1}.

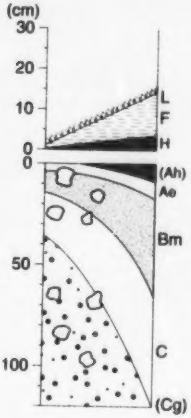
Mode of Deposition	ROCK	CTILL	AEOLIAN	FLU	FTILL ■	LAC ■	ORG		
Moisture Regime	0-0	1	2 ■	3 ■	4	5	6	7	8
Soil Texture	ROCK	SDY	CLMY	MLMY	SIY	FLMY ■	CLY ■	ORG	
Organic Matter Depth	0-9 ■	10-19 ■	20-39	40-120	>120				
Humus Form	MULL	MODER ■	HMOR	FMOR ■	HUMIC	MESIC	FIBRIC		

Comments: Found mainly in the Clay Belt. Free carbonates common within 100 cm of soil surface. Abundant balsam fir shrubs and tall shrubs in understorey.

Trembling Aspen – White Birch – Medium Soil

ES 7m

Description: Hardwood mixedwood stands on fresh to moist, medium loamy to silty soils. Medium number of shrubs and herbs, with abundant tall shrubs (n = 48).



Overstorey: Trembling aspen^7, White birch^5, Balsam fir^4, White spruce^4, Black spruce^3, Jack pine^1, White cedar^1.

Shrubs: Balsam fir, White birch, Trembling aspen, White spruce; Mountain maple, Bunchberry, Beaked hazel, Bush honeysuckle, Canada honeysuckle, Dwarf raspberry, Mountain ashes, Twinflower.

Herbs: Blue bead lily, Sarsaparilla, Wild lily-of-the-valley, Starflower, Large-leaved aster, Rose twisted-stalk, Violets, Fragrant bedstraw, Goldthread, Sedges, Spinulose shield fern, Ground pine.

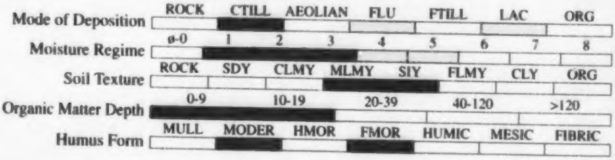
Mosses, Lichens and Liverworts: Schreber's moss, Curly heron's bill moss, *Brachythecium* spp., Plume moss, Wavy-leaved moss.

Vegetation Types: V8^2, V5^2, V4^1, V13^1, V1^1, V12^1, other^2.

Ground Surface: Abundant deciduous litter with feathermoss and conifer litter present.

Landforms: Ground moraine, ablation till, end moraine, silty glaciolacustrine or alluvial (riverine) deposits. Few to many coarse fragments.

Soil Types: S9^4, S10^2, S11^2, (S12, S15)^2.

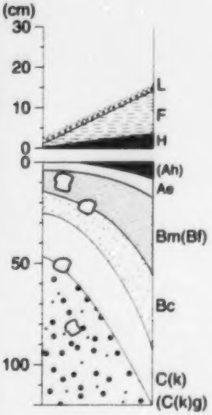


Comments: Abundant tall shrubs (especially mountain maple). Balsam fir shrubs present in understorey. Free carbonates often found within 100 cm of soil surface.

Trembling Aspen – White Birch – Coarse Soil

ES 7c

Description: Hardwood mixedwood stands on dry to moderately moist, sandy to coarse loamy soils. Medium number of shrubs and herbs with abundant tall shrubs (n = 54).



Overstorey: Trembling aspen^{8}, White birch^{5}, White spruce^{4}, Balsam fir^{4}, White cedar^{2}, Black spruce^{1}.

Shrubs: Balsam fir, White birch; Mountain maple, Bunchberry, Bush honeysuckle, Beaked hazel, Canada honeysuckle, Dwarf raspberry, Twinflower, Mountain ashes.

Herbs: Wild lily-of-the-valley, Blue bead lily, Sarsaparilla, Large-leaved aster, Starflower, Rose twisted-stalk, Violets, Ground pine, Fragrant bedstraw.

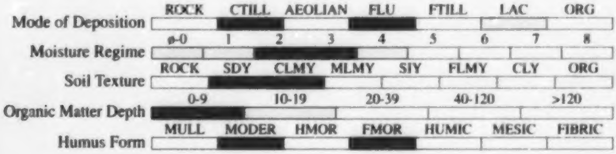
Mosses, Lichens and Liverworts: Schreber's moss, Curly heron's bill moss, *Brachythecium* spp., Sickle moss.

Vegetation Types: V4^{4}, V5^{2}, V1^{1}, V16^{1}, (V2, V12, V8)^{1}, other^{1}.

Ground Surface: Abundant deciduous litter with feathermoss and conifer litter present.

Landforms: Outwash plains, eskers, kames, esker/kame complexes, beaches, end moraine, coarse textured ablation till or ground moraine, sandy lakebed deposits. Few to many coarse fragments.

Soil Types: S5^{3}, S7^{2}, S1^{2}, S2^{1}, (S6, S3, S4, S15, S8)^{2}.

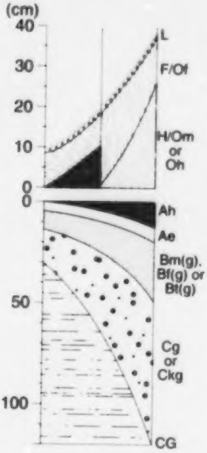


Comments: Balsam fir shrubs and mountain maple abundant in understorey. Free carbonates often present within 100 cm of soil surface.

Black Spruce – Feathermoss – Sphagnum – Moist Soil

ES 8

Description: Black spruce stands on moist, sandy to clayey soils (all mineral soils). Shrub and herb poor, with abundant feathermoss and sphagnum (n = 53).



Overstorey: Black spruce[10], Balsam fir[1], Jack pine[1], Larch[1].

Shrubs: Black spruce, Balsam fir; Labrador-tea, Creeping snowberry, Early low blueberry, Bunchberry, Velvetleaf blueberry, Sheep laurel, Twinflower.

Herbs: Woodland horsetail, Goldthread, Sedges, Wild lily-of-the-valley, Three-leaved smilacina.

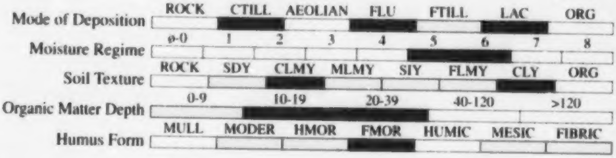
Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Lady's tresses peat moss, Reindeer lichen, Common green peat moss, Plume moss, Northern naugehyde liverwort, Stair-step moss, False pixie cup.

Vegetation Types: V27[3], V26[2], V24[2], V23[1], other[2].

Ground Surface: Abundant feathermoss and sphagnum moss on low hummocks, with sparse patches of lichens and coniferous litter.

Landforms: Poorly drained peaty phase soils on a variety of materials and landforms, on lower slope positions in gently sloping terrain. Few coarse fragments.

Soil Types: S16[4], S14[1], S15[1], S3[1], S8[1], (S7, S4, S11, S12, S13)[2].

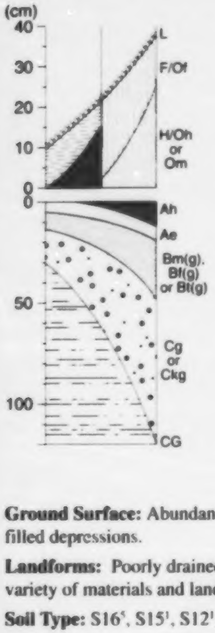


Comments: Abundant black spruce shrubs. Free carbonates commonly present within 100 cm of soil surface.

Black Spruce – Larch – Moist Soil – Species Poor

ES 9p

Description: Conifer stands on moist, sandy to clayey (all mineral soils). Medium number of shrubs and herbs, abundant feathermoss (n = 38).



Overstorey: Black spruce^{10}, Larch^{2}, Balsam fir^{2}, White birch^{2}, Jack pine^{1}.

Shrubs: Black spruce, Balsam fir; Creeping snowberry, Bunchberry, Labrador-tea, Speckled alder, Twinflower, Early low blueberry, Dwarf raspberry, Velvetleaf blueberry, Serviceberries, Bristly wild rose, Mountain ashes, Swamp red currant.

Herbs: Goldthread, Sedges, Woodland horesetail, Wild lily-of-the-valley, Blue bead lily, Starflower, Violets, Naked mitrewort, Sweet coltsfoot, Sarsaparilla, Wild strawberry, Wood anemone, Fragrant bedstraw, Three-leaved smilacina.

Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Lady's tresses peat moss, Common green peat moss, Wavy-leaved moss, Reindeer lichen, Stair-step moss, Wulf's peat moss.

Vegetation Types: V23^{1}, V24^{1}, V25^{2}, other^{2}.

Ground Surface: Abundant feathermoss and sphagnum often with small water-filled depressions.

Landforms: Poorly drained soils, often peaty phase, on lower slopes on a variety of materials and landforms. Few coarse fragments.

Soil Type: S16^{5}, S15^{1}, S12^{1}, S11^{1}, S14^{1}, (S7, S13, S8)^{1}.

	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG
Mode of Deposition		■		■	■	■	

	ø-0	1	2	3	4	5	6	7	8
Moisture Regime						■	■		

	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG
Soil Texture							■	

	0-9	10-19	20-39	40-120	>120
Organic Matter Depth		■	■		

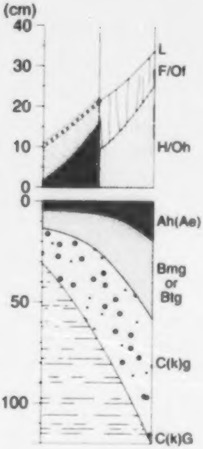
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC
Humus Form				■			■

Comments: Often found on telluric lower slope positions. Black spruce shrubs abundant, ericaceous shrubs abundant, balsam fir shrubs present in understorey. Free carbonates commonly present within 100 cm of soil surface.

White Spruce – Balsam Fir – White Cedar – Moist Soil – Species Rich

ES 9r

Description: Conifer stands on moist sandy to clayey (all mineral soils). Medium number of shrubs, herb rich (n = 27).



Overstorey: White spruce^{9}, Balsam fir^{6}, White birch^{5}, Black spruce^{3}, White cedar^{3}.

Shrubs: Balsam fir, White birch, Black spruce, White cedar; Dwarf raspberry, Bunchberry, Mountain ashes, Mountain maple, Twinflower, Speckled alder, Swamp red currant, Canada honeysuckle, Creeping snowberry, Bristly black currant, Serviceberries, Bristly wild rose, Red osier dogwood, Red raspberry.

Herbs: Sarsaparilla, Blue bead lily, Wild lily-of-the-valley, Starflower, Goldthread, Violets, Fragrant bedstraw, Oak fern, Sedges, Naked mitrewort, Rose twisted-stalk, Spinulose shield fern, Woodland horsetail, Wood anemone, Interrupted clubmoss, Sweet coltsfoot, Northern bluebells, Large-leaved aster, Northern lady fern, Dwarf rattlesnake plantain.

Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Stair-step moss, Curly heron's bill moss, Electrified cat-tail moss, Wavy-leaved moss, Sickle moss.

Vegetation Types: V16^{4}, V14^{1}, V13^{1}, V15^{1}, V1^{1}, V8^{1}, other^{1}.

Ground Surface: Abundant feathermoss with very little sphagnum moss; deciduous and conifer litter abundant, with few small water-filled depressions.

Landforms: Poorly drained soils, often peaty, on lower slopes on a variety of materials and landforms. Few coarse fragments.

Soil Types: S15^{3}, S16^{2}, S14^{2}, S11^{1}, (S12, S3, S7, S8)^{1}.

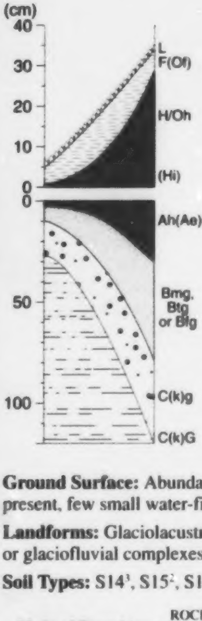
	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG	
Mode of Deposition		▨		▨		▨		
	0-0	1	2	3	4	5	6	7	8
Moisture Regime							▨		
	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG	
Soil Texture					▨	▨			
	0-9	10-19	20-39	40-120	>120				
Organic Matter Depth	▨	▨	▨						
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC		
Humus Form			▨	▨					

Comments: Often found on telluric lower slope positions associated with nutrient enriched seepage flow. Broad leaved shrubs common, white cedar shrubs common, balsam fir shrubs present in understorey. Free carbonates common within 100 cm of soil surface.

Trembling Aspen – Black Spruce – Balsam Poplar – Moist Soil

ES 10

Description: Hardwood mixedwood stands on moist, sandy to clayey (all mineral soil types) soils. Medium number of shrubs, herb rich, speckled alder common (n = 89).



Overstorey: Trembling aspen^8, Black spruce^4, Balsam poplar^4, Balsam fir^3, White spruce^3, White birch^2, Jack pine^1, Black ash^1.

Shrubs: Balsam fir, Black spruce, Trembling aspen; Dwarf raspberry, Bunchberry, Speckled alder, Bristly wild rose, Red raspberry, Twinflower, Bristly black currant, Serviceberries, Mountain ashes, Swamp red currant, Mountain maple, Red osier dogwood.

Herbs: Wild lily-of-the-valley, Violets, Naked mitrewort, Fragrant bedstraw, Starflower, Sarsaparilla, Blue bead lily, Large-leaved aster, Spinulose shield fern, Sweet coltsfoot, Sedges, Goldthread, Woodland horsetail, Canada blue-joint, Oak fern.

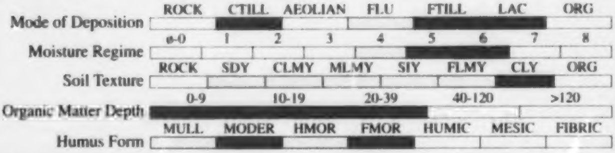
Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Curly heron's bill moss, Electrified cat-tail moss.

Vegetation Types: V10^3, V15^1, V13^1, V8^1, (V4, V11, V12, V14, V7)^2, other^2.

Ground Surface: Abundant deciduous litter with conifer litter and feathermoss present, few small water-filled depressions.

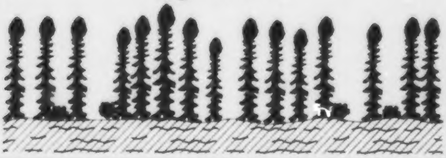
Landforms: Glaciolacustrine silts and clays or clay tills, silt pockets in morainal or glaciofluvial complexes. Few to moderate coarse fragments.

Soil Types: S14^3, S15^2, S16^2, S11^1, other^2.



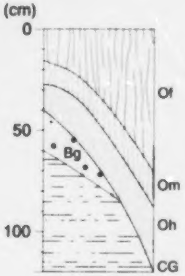
Comments: Often found on telluric lower slope positions associated with nutrient-enriched seepage flow. On calcareous soils with characteristic Hi/Ah humus horizons. Broad leaved shrubs common in understorey. White cedar and American elm found on one percent of this ecosite. Free carbonates commonly present within 100 cm of soil surface.

Black Spruce – Labrador-tea – Organic Soil



ES 11

Description: Conifer (Black spruce) stands on wet deep fibric organic soils. Shrub and herb poor, with abundant Labrador-tea, sphagnum and feathermoss (n = 49).



Overstorey: Black spruce^{10}.

Shrubs: Black spruce; Labrador-tea, Creeping snowberry, Leatherleaf, Small cranberry, Early low blueberry, Bog laurel, Velvetleaf blueberry, Sheep laurel, Bunchberry.

Herbs: Sedges, Three-leaved smilacina, Goldthread.

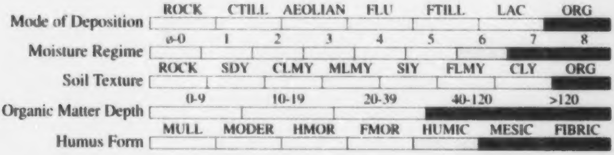
Mosses, Lichens and Liverworts: Schreber's moss, Red fat-leaved peat moss, Lady's tresses peat moss, Common green peat moss, Reindeer lichen, Brown bog peat moss, Wavy-leaved moss, Northern naugehyde liverwort, Plume moss, Yellow two-leaved peat moss, False pixie cup, Powder horn lichen.

Vegetation Types: V26^{7}, V27^{2}, (V28, V24)^{1}.

Ground Surface: Abundant moderate hummocks of sphagnum and feathermoss with sparse, small water-filled depressions.

Landforms: Moderately deep to deep fibric or mesic organic soils in flat terrain.

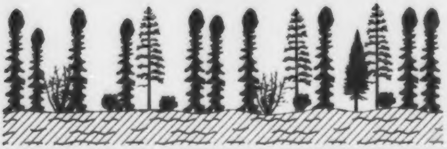
Soil Types: S17^{6}, S18^{1}, S19^{1}.



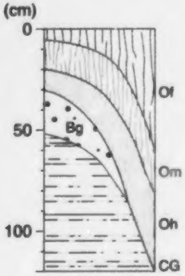
Comments: Often dense, slow-growing, all-aged stands with abundant black spruce shrubs. Ericaceous shrubs abundant.

Black Spruce – Larch – Labrador-tea – Organic Soil

ES 12



Description: Black spruce and larch stands on wet moderately deep fibric organic soils. Medium number of shrubs, herb poor (n = 97).



Overstorey: Black spruce^{10}, Larch^{3}, Balsam fir^{1}.

Shrubs: Black spruce, Balsam fir; Creeping snowberry, Labrador-tea, Bunchberry, Speckled alder, Twinflower, Dwarf raspberry, Velvetleaf blueberry, Early low blueberry, Small cranberry.

Herbs: Sedges, Goldthread, Three-leaved smilacina, Naked mitrewort, Woodland horsetail.

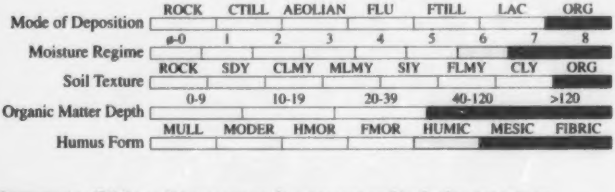
Mosses, Lichens and Liverworts: Schreber's moss, Common green peat moss, Plume moss, Stair-step moss, Lady's tresses peat moss, Wavy-leaved moss, Red fat-leaved peat moss, Reindeer lichen, False pixie cup, Powder horn lichen, Curly heron's bill moss.

Vegetation Types: V24^{5}, V25^{2}, V23^{1}, V26^{1}, other^{1}.

Ground Surface: Abundant moderate hummocks of sphagnum and feathermoss, with patches of coniferous litter present. Small water-filled depressions common on sites with strong ground water flow, sparse on sites with weak flow.

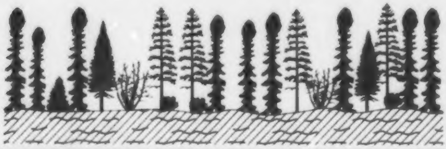
Landforms: Moderately deep to shallow fibric and mesic organic soils, usually associated with drainage ways.

Soil Types: S17^{6}, S18^{3}, S19^{1}.



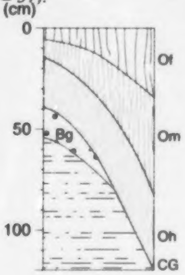
Comments: White cedar present on five percent and jack pine present on three percent of this ecosite. Free carbonates often present within 100 cm of soil surface.

Black Spruce – Larch – Speckled Alder – Organic Soil – Species Poor



ES 13p

Description: Black spruce and larch stands on wet moderately deep fibric organic soils. Shrub and herb rich with abundant sphagnum and feathermosses (n = 57).



Overstorey: Black spruce^{10}, Larch^{4}, Balsam fir^{2}.

Shrubs: Black spruce, Balsam fir; Bunchberry, Creeping snowberry, Labrador-tea, Speckled alder, Dwarf raspberry, Twinflower, Northern honeysuckle, Early low blueberry, Velvetleaf blueberry, Bristly black currant, Swamp red currant, Red osier dogwood, Bristly wild rose, Mountain ashes, Red raspberry, Serviceberries, Small cranberry.

Herbs: Sedges, Naked mitrewort, Goldthread, Violets, Fragrant bedstraw, Starflower, Wild lily-of-the-valley, Three-leaved smilacina, Wood anemone, Sarsaparilla, Blue bead lily, Woodland horesetail, Oak fern, Sweet coltsfoot, Canada blue-joint.

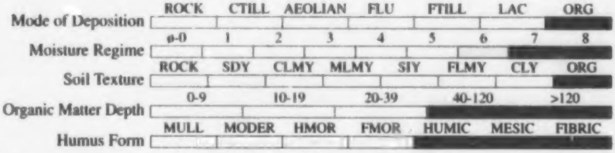
Mosses, Lichens and Liverworts: Schreber's moss, Stair-step moss, Common green peat moss, Plume moss, Lady's tresses peat moss, Wavy-leaved moss, *Mnium* spp., Electrified cat-tail moss, Reindeer lichen, Red fat-leaved peat moss.

Vegetation Types: V25^{5}, V24^{2}, V23^{1}, V16^{1}, V15^{1}.

Ground Surface: High hummocks of sphagnum and feathermoss with sparse patches of litter and abundant small water-filled depressions present.

Landforms: Shallow humic organic soils, associated with strong drainage at the toe of steep slopes, and bottoms of valleys adjacent to drainage ways.

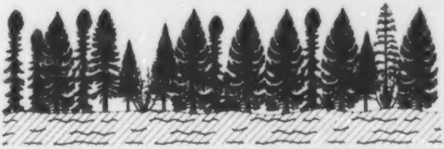
Soil Types: S17^{6}, S18^{2}, S19^{2}.



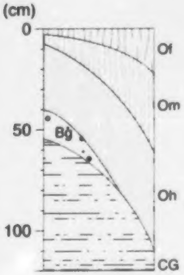
Comments: White cedar, balsam poplar and white birch found on four percent of this ecosite. Free carbonates often present within 100 cm of soil surface.

White Cedar – Black Spruce – Organic Soil – Species Rich

ES 13r



Description: White cedar and black spruce stands on wet shallow fibric (or humic, or mesic) organic soils. Medium number of shrubs, herb rich with abundant feathermoss (n = 15).



Overstorey: White cedar^9, Black spruce^6, Balsam fir^5, White spruce^2, White birch^1, Black ash^1, Larch^1, Balsam poplar^1.

Shrubs: Balsam fir, White cedar, Black spruce, White birch; Bunchberry, Dwarf raspberry, Speckled alder, Red osier dogwood, Twinflower, Canada honeysuckle, Mountain ashes, Squashberry, Creeping snowberry, Mountain maple, Bristly black currant, Labrador-tea.

Herbs: Violets, Sedges, Goldthread, Fragrant bedstraw, Naked mitrewort, Starflower, Oak fern, Wood anemone, Sarsaparilla, Blue bead lily, Wild lily-of-the-valley, Woodland horsetail, Northern bluebells, Rose twisted-stalk, Three-leaved smilacina, Broad-leaved reed grass.

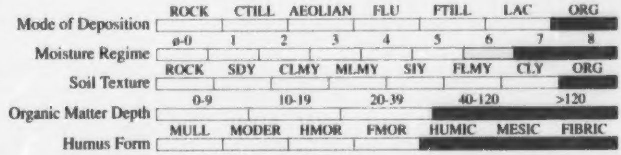
Mosses, Lichens and Liverworts: Schreber's moss, Stair-step moss, Electrified cat-tail moss, Curly heron's bill moss, Common green peat moss, *Mnium* spp., Plume moss, Lady's tresses peat moss.

Vegetation Types: V16^6, V25^2, (V9, V14, V23)^2.

Ground Surface: Abundant feathermoss and sphagnum, small water-filled depressions present.

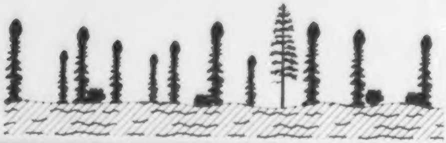
Landforms: Shallow humic organic soils associated with strong drainage (toe of steep slopes, bottom of valleys and adjacent to drainageways).

Soil Types: S19^5, S17^3, S18^2.



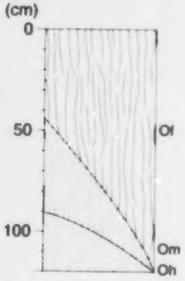
Comments: Sphagnum less common than in ES13p. Tree canopy uneven with many openings. Free carbonates often found within 100 cm of soil surface.

Black Spruce – Leatherleaf – Organic Soil



ES 14

Description: Stunted black spruce stands on wet very deep fibric organic soils. Medium number of ericaceous shrubs, herb poor (n = 17).



Overstorey: Black spruce^{7}, Larch^{1}.

Shrubs: Black spruce, Larch; Labrador-tea, Small cranberry, Bog rosemary, Leatherleaf, Bog laurel, Creeping snowberry, Early low blueberry.

Herbs: Sedges, Three-leaved smilacina, Goldthread.

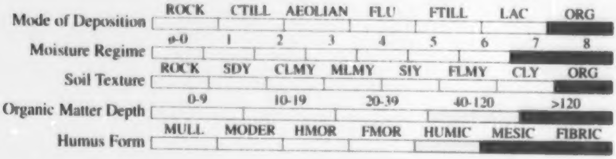
Mosses, Lichens and Liverworts: Brown bog peat moss, Schreber's moss, Yellow two-leaved peat moss, Red fat-leaved peat moss, Common green peat moss, Reindeer lichen, Plume moss, Lady's tresses peat moss.

Vegetation Types: V28^{9}, (V25, V26)^{1}.

Ground Surface: Abundant low to moderate hummocks of sphagnum with feathermoss present, small water-filled depressions common.

Landforms: Deep fibric organic soils, in flat terrain or depressions.

Soil Types: S17^{7}, S18^{2}, S19^{1}.

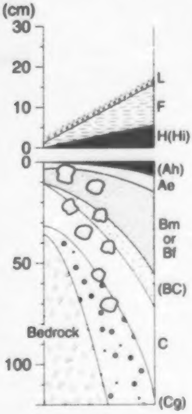


Comments: Found on flat terrain or in depressions associated with a wide range of semi-treed to open swamps, bogs and fens (this ecosite is a transition from forest to wetland). Mature trees are often less than 10 m tall on this ecosite.

Red Maple

ES 15

Description: Tolerant hardwood mixedwood stands with red maple in the canopy and sapling layer, on dry to fresh, sandy to silty soil. Medium number of shrubs and herbs, with abundant beaked hazel and mountain maple in the understorey (n = 14).



Overstorey: Red maple^{10}, White birch^{8}, Balsam fir^{6}, Trembling aspen^{6}, White spruce^{4}, White cedar^{1}.

Shrubs: Balsam fir, Red maple, White birch, White spruce; Mountain maple, Beaked hazel, Early low blueberry, Bush honeysuckle, Bunchberry, Twinflower, Velvetleaf blueberry.

Herbs: Large-leaved aster, Blue bead lily, Ground pine, Sarsaparilla, Bracken fern, Wild lily-of-the-valley, Starflower, Goldthread, Rose twisted-stalk, Violets, Spinulose shield fern.

Mosses, Lichens and Liverworts: Curly heron's bill moss, *Brachythecium* spp., Schreber's moss, *Cladonia* spp., Wavy-leaved moss, Juniper moss.

Vegetation Types: V4^{6}, V2^{4}.

Ground Surface: Abundant deciduous litter with sparse conifer litter, often with patches of stones and bedrock. Feathermoss present.

Landforms: Typically on till materials on ridge or hill tops. Moderate to many coarse fragments.

Soil Types: S11^{2}, S5^{2}, S9^{2}, S7^{1}, SS3^{1}, S15^{1}, S1^{1}.

	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG
Mode of Deposition		■					

	0-0	1	2	3	4	5	6	7	8
Moisture Regime		■	■	■					

	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG
Soil Texture			■		■			

	0-9	10-19	20-39	40-120	>120
Organic Matter Depth	■				

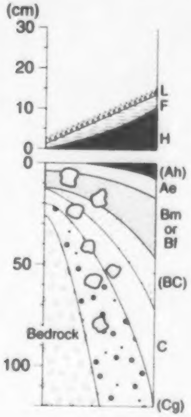
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC
Humus Form		■		■			

Comments: Found on ridges, plateaus or hill tops in warm ecoclimates throughout Site Region 4E, seldom in Site Region 3E.

Yellow Birch

ES 16

Description: Yellow birch stands on dry to moist, rocky to silty sites. Shrub poor with a medium number of herbs, abundant mountain maple in the understorey (n = 14).



Overstorey: Yellow birch^{10}, White birch^{6}, White spruce^{6}, Trembling aspen^{4}, Balsam fir^{2}, Red maple^{1}, White cedar^{1}.

Shrubs: Balsam fir, White spruce, Yellow birch; Mountain maple, Beaked hazel, Bunchberry, Canada honeysuckle, Bush honeysuckle, Mountain ashes.

Herbs: Blue bead lily, Spinulose shield fern, Sarsaparilla, Wild lily-of-the-valley, Large-leaved aster, Shining clubmoss, Starflower, Ground pine, Sedges, Violets, Upright wood-sorrel.

Mosses, Lichens and Liverworts: Curly heron's bill moss, Schreber's moss, Common hair cap moss.

Vegetation Types: V2^{5}, V1^{3}, V4^{1}, V3^{1}.

Ground Surface: Abundant deciduous litter with feathermoss and conifer litter present.

Landforms: Ablation till, ground moraine, end moraine, outwash plains, deltas, esker and kame complexes. Moderate to many coarse fragments.

Soil Types: S5^{4}, S11^{4}, (SS3, S3, S7)^{2}.

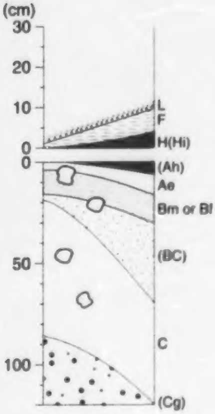
	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG		
Mode of Deposition		■		■					
	0-0	1	2	3	4	5	6	7	8
Moisture Regime		■		■					
	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG	
Soil Texture			■		■				
	0-9	10-19	20-39	40-120	>120				
Organic Matter Depth	■								
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC		
Humus Form		■		■					

Comments: Found on ridges, plateaus or hill tops in warm ecoclimates in Site Region 4E, mainly near the southern border of the boreal forest. Broad leaved shrubs common. Ground hemlock is sometimes found in the understorey.

Sugar Maple

ES 17

Description: Sugar maple stands on dry to fresh, coarse loamy and silty sites. Shrub poor, with a medium number of herbs (n = 7).



Overstorey: Sugar maple^{10}, Trembling aspen^{6}, White spruce^{3}, Yellow birch^{1}, White birch^{1}, White cedar^{1}.

Shrubs: Sugar maple, Balsam fir, White spruce, Trembling aspen; Mountain maple, Beaked hazel, Bush honeysuckle.

Herbs: Large-leaved aster, Blue bead lily, Spinulose shield fern, Ground pine, Starflower, Sarsaparilla, Rose twisted-stalk, Fragrant bedstraw, Shining clubmoss, Wild lily-of-the-valley, Bracken fern, Sedges.

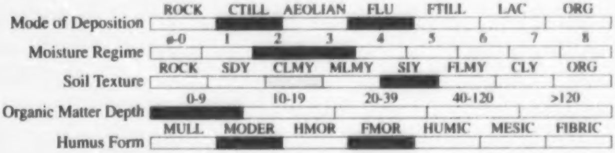
Mosses, Lichens and Liverworts: *Brachythecium* spp., Curly heron's bill moss, *Mnium* spp.

Vegetation Types: V3^{9}, V1^{1}.

Ground Surface: Abundant deciduous litter with almost no feathermoss, sphagnum or conifer litter present.

Landforms: Ablation till, ground moraine, fine outwash, deltas, silty lacustrine deposits. Few to moderate coarse fragments.

Soil Types: S9^{7}, S11^{2}, S7^{1}.

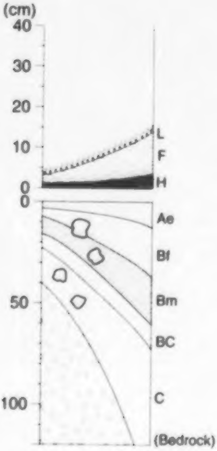


Comments: Found on ridges, plateaus or hill tops in warm ecoclimates in Site Region 4E, mainly near the southern border of the boreal forest. Mountain maple and beaked hazel abundant.

Jack Pine – White Pine – Red Pine

ES 18

Description: Jack pine, white pine and/or red pine stands on deep, dry to fresh, sandy to coarse loamy soils. Medium number of shrubs, herb poor (n = 22).



Overstorey: Jack pine^{7}, White pine^{6}, Red pine^{5}, Black spruce^{3}, White birch^{2}, Trembling aspen^{1}.

Shrubs: Black spruce, Balsam fir, White pine, White birch, Red pine; Early low blueberry, Bush honeysuckle, Velvet-leaf blueberry, Bunchberry, Willows, Twinflower, Serviceberries.

Herbs: Wild lily-of-the-valley, Bracken fern, Sarsaparilla, Blue bead lily.

Mosses, Lichens and Liverworts: Schreber's moss, Reindeer lichen, Wavy-leaved moss, Naugehyde liverwort, Curly heron's-bill moss.

Vegetation Types: V18^{3}, (V21, V5)^{3}, V4^{1}, V6^{1}, (V7, V8, V15, V16, V17, V20)^{2}.

Ground Surface: Varying proportions of coniferous litter and feathermoss, with scattered patches of lichen.

Landforms: Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraines, shallow till veneer over bedrock and sand dunes. Coarse fragments few to many.

Soil Types: S1^{6}, S5^{1}, SS3^{1}, (S7, S13, SS2, SS4)^{2}.

Mode of Deposition	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG
		■		■			

Moisture Regime	ø-0	1	2	3	4	5	6	7	8
	■								

Soil Texture	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG
		■	■					

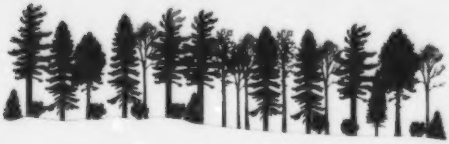
Organic Matter Depth	0-9	10-19	20-39	40-120	>120
	■	■			

Humus Form	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC
				■			

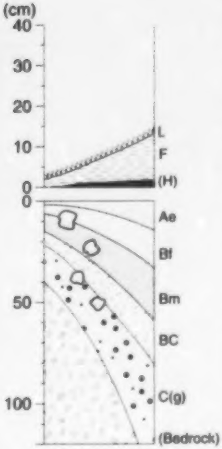
Comments: Abundant ericaceous shrubs, black spruce and balsam fir regeneration in understorey. Typically on deep sandy or shallow coarse soils.

White Pine – Red Pine – Mixedwood

ES 19



Description: White pine – red pine mixedwood stands, usually on dry to fresh, sandy to coarse loamy soils. Medium number of shrubs, herb poor (n = 29).



Overstorey: White pine^{9}, White spruce^{6}, Red pine^{6}, White birch^{6}, Black spruce^{3}, Balsam fir^{2}, Jack pine^{2}, Trembling aspen^{1}, Large-toothed aspen^{1}, Red maple^{1}.

Shrubs: Balsam fir, Red maple, White spruce, White birch, White pine, Trembling aspen, Black spruce; Early low blueberry, Beaked hazel, Bush honeysuckle, Bunchberry, Twinflower, Velvetleaf blueberry, Serviceberries, Mountain maple, Canada honeysuckle, Mountain ashes.

Herbs: Wild lily-of-the-valley, Sarsaparilla, Large-leaved aster, Bracken fern, Blue bead lily, Starflower, Goldthread.

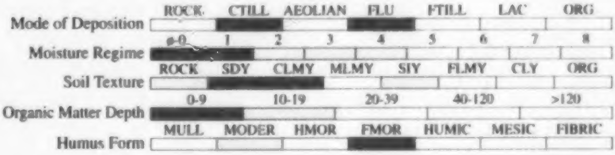
Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, *Brachythecium* spp., Spiky dicranum, Naugehyde liverwort.

Vegetation Types: V4^{3}, V5^{3}, V7^{1}, V6^{1}, (V2, V3, V8, V17)^{2}.

Ground Surface: Conifer and broad leaved litter, with scattered patches of feathermoss.

Landforms: Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, and end moraines. Coarse fragments few to many.

Soil Types: S1^{3}, S5^{3}, S7^{1}, (S2, S9, S11, SS2, SS3, SS4)^{1}.

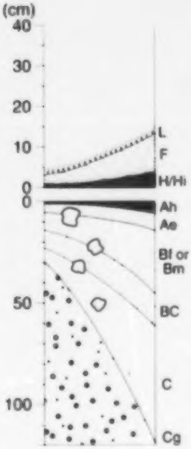


Comments: Understorey is a mixture of ericaceous, coniferous and broad leaved shrubs, generally low in height. Less feathermoss and lichen than in ES18.

White Pine – Hardwood Mixedwood

ES 20

Description: White pine – hardwood mixedwood stands on a variety of soils. Medium number of shrubs and herbs (n = 12).



Overstorey: White pine^{8}, White birch^{7}, Trembling aspen^{6}, White spruce^{4}, Balsam fir^{3}, White cedar^{2}, Red pine^{1}, Jack pine^{1}, Black ash^{1}, Yellow birch^{1}.

Shrubs: Balsam fir, Trembling aspen, White spruce, White cedar, White birch; Dwarf raspberry, Mountain maple, Beaked hazel, Canada honeysuckle, Bunchberry, Bush honeysuckle, Mountain ashes, Twinflower, Serviceberries.

Herbs: Blue bead lily, Wild lily-of-the-valley, Sarsaparilla, Large-leaved aster, Starflower, Goldthread, Violets, Bracken fern, Ground pine, Rose twisted-stalk, Sedges, Spinulose shield fern, Shining clubmoss, *Pyrola* spp., Fragrant bedstraw.

Mosses, Lichens and Liverworts: *Brachythecium* spp., Schreber's moss, *Mnium* spp., Curly heron's-bill moss, Common hair cap moss, *Plagiothecium* spp., Sickle moss, Spiky dicranum, Jameson's liverwort.

Vegetation Types: V1^{3}, V2^{3}, V4^{3}, (V10, V12)^{1}.

Ground Surface: Varying proportions of broad leaved and conifer litter.

Landforms: Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraines and sandy lake plains. Coarse fragments few to many.

Soil Types: S11^{4}, S7^{2}, (S1, S3, S9, S15, SS3)^{4}.

	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC	ORG
Mode of Deposition		■		■			

	0-0	1	2	3	4	5	6	7	8
Moisture Regime				■					

	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY	ORG
Soil Texture					■			

	0-9	10-19	20-39	40-120	>120
Organic Matter Depth	■	■			

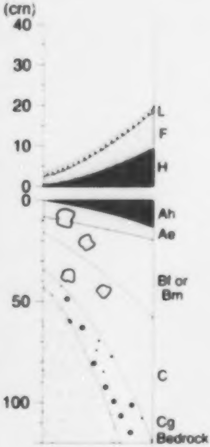
	MULL	MODER	HMOR	FMOR	HUMIC	MESIC	FIBRIC
Humus Form		■		■			

Comments: Abundant tall broad leaved shrubs in understorey. Generally on richer soils than other pine types.

White Pine – Coniferous Mixedwood

ES 21

Description: White pine – conifer mixedwood stands on dry to moist, sandy to silty soils. Shrub and herb poor (n = 8).



Overstorey: White pine^{10}, Balsam fir^{8}, White cedar^{6}, White birch^{6}, Black spruce^{3}, White spruce^{1}, Red maple^{1}, Trembling aspen^{1}.

Shrubs: Balsam fir, White cedar, White birch, Red maple, White pine; Mountain maple, Bunchberry, Canada honeysuckle, Mountain ashes, Twinflower, Creeping snowberry, Velvetleaf blueberry, Early low blueberry.

Herbs: Blue bead lily, Starflower, Goldthread, Wild lily-of-the-valley, Sarsaparilla, Bracken fern, Oak fern, Spinulose shield fern, Rose twisted-stalk.

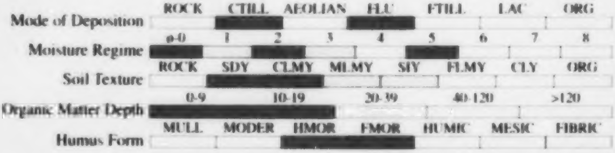
Mosses, Lichens and Liverworts: Broom moss, Schreber's moss, Three-lobed bazzania, *Mnium* spp., Naugehyde liverwort, Reindeer lichen, Lawn moss, *Brachythecium* spp., *Plagiothecium* spp., Lady's tresses peat moss.

Vegetation Types: V4^{6}, V1^{1}, V3^{1}, V13^{1}, V14^{1}.

Ground Surface: Mainly coniferous litter, with scattered patches of broad leaved litter and feathermosses.

Landforms: Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraines. Coarse fragments few to many.

Soil Types: S7^{3}, S9^{3}, SS3^{2}, (S3, S5)^{2}.



Comments: Compared with ES20, stands have a more dominant coniferous content, and lower abundance and diversity of shrubs and herbs.

Species Percentage Cover by Ecosite

Species Percentage Cover by Ecosite

Cover values are given for species occuring on more than two-thirds of sample plots in an ecosite. Species in brackets are those occuring on more than one-third but less than two-thirds of plots.

Codes: 1 = 1% 2 = 2 to 5% 3 = 6 to 10% 4 = 11 to 20% 5 = 21 to 40% 6 > 40%

ES	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p
Trees															
Abies balsamea		(3)						(4)	(5)	(3)	(4)	(4)	(4)		
Acer rubrum															
Acer saccharum ssp. *saccharum*															
Betula alleghaniensis															
Betula papyrifera		4		4							(3)	(3)	(3)		
Larix laricina															
Picea glauca		3		(4)						(4)	(4)	(4)	(4)		
Picea mariana	4			(4)	4	5	5	4	(4)	(4)				5	5
Pinus banksiana	(4)		5	(4)	4		(4)			(4)					
Pinus resinosa															
Pinus strobus															
Populus balsamifera* ssp. *balsamifera															
Populus tremuloides				4				(5)	5	5	5	5	5		
Thuja occidentalis															
Tree Shrubs															
Abies balsamea	2	4	(2)	4	(3)	3	4	3	3	3	3	3	4	3	3
Acer rubrum															
Acer saccharum ssp. *saccharum*															
Betula alleghaniensis															
Betula papyrifera	(2)	2		2	(2)		(1)	(2)		(2)	(2)	(2)	(2)		
Larix laricina															
Picea glauca		2		(2)						(2)	(2)	(2)	(2)		
Picea mariana	4	(2)	3	3	4	3	3	2	(3)	(3)				4	3
Pinus banksiana			(2)												
Pinus resinosa															
Pinus strobus															

9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21	ES
														Trees
(3)					(2)		(3)						3	*Abies balsamea*
							4							***Acer rubrum***
									6					*Acer saccharum* ssp. *saccharum*
								5						***Betula alleghaniensis***
(4)							5	(4)			(4)	5	(4)	*Betula papyrifera*
				(4)										***Larix laricina***
5							(3)	(4)			(4)	(4)		*Picea glauca*
	(4)	5	5	5	(3)	3							(3)	***Picea mariana***
										5				*Pinus banksiana*
										(5)	(5)			***Pinus resinosa***
										(4)	5	5	4	*Pinus strobus*
	(5)													***Populus balsamifera* ssp. *balsamifera***
	5						(4)	(4)	(5)			(5)		*Populus tremuloides*
					5								(5)	***Thuja occidentalis***
														Tree Shrubs
3	3		(2)	3	3		4	4	3	3	4	4	4	*Abies balsamea*
							3				3		(3)	***Acer rubrum***
									6					*Acer saccharum* ssp. *saccharum*
								(2)						***Betula alleghaniensis***
(2)					(1)		(2)	(2)		(2)	(2)	(2)	(3)	*Betula papyrifera*
						(2)								***Larix laricina***
	(2)						(2)	2	2		(3)	(2)		*Picea glauca*
(2)	(3)	5	4	3	(2)	5	(2)			4	(3)			***Picea mariana***
														Pinus banksiana
										(2)				***Pinus resinosa***
										2	(2)		(1)	*Pinus strobus*

...Species Percentage Cover by Ecosite

ES	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p
Trees Shrubs															
Populus tremuloides				(2)				(2)	(2)	(2)	(2)	(2)	(2)		
Thuja occidentalis															
Shrubs															
Acer spicatum		(4)		(3)							5	5	5		
Alnus incana* ssp. *rugosa						(2)		(3)	4						4
Alnus viridis ssp. *crispa*		(2)													
***Amelanchier* spp.**	(1)	(1)	(2)	(2)	(1)		(1)	(1)	2	2	(2)	(2)			1
Andromeda polifolia ssp. *glaucophylla*															
Betula pumila															
Chamaedaphne calyculata															
Cornus canadensis	2	2	(2)	2	2	2	2	2	2	3	2	2	2	2	2
Cornus stolonifera									(2)						(2)
Corylus cornuta* ssp. *cornuta		(3)		(3)					(2)	(2)	3	3	4		
Diervilla lonicera		(2)		2	(2)		(2)	(3)	3	3	(3)	3	3		
Epigaea repens			(2)		(2)										
Gaultheria hispidula	(2)		(2)	(2)	2	2	2	(1)	(1)					2	2
Gaultheria procumbens			(2)												
Kalmia angustifolia			(5)		(3)									(3)	(2)
Kalmia polifolia															
Ledum groenlandicum	(4)				(3)	(3)	(3)							4	3
Linnaea borealis* ssp. *longiflora	(2)	(2)	(2)	2	2	1	(2)	2	1	2	(2)	(2)	(2)	(1)	2
Lonicera canadensis		(2)						(1)	(2)		2	(2)	(2)		
Lonicera villosa															(1)
Oxycoccus microcarpus															
Prunus virginiana* ssp. *virginiana															
Rhamnus alnifolia															

...Species Percentage Cover by Ecosite

9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21	ES
														Trees Shrubs
	(2)						(1)		(1)		(2)	(2)		*Populus tremuloides*
(4)					4							(3)	(3)	***Thuja occidentalis***
														Shrubs
4	(4)				(3)		4	5	2		(3)	5	2	*Acer spicatum*
4	(4)		4	4	4									***Alnus incana* ssp. *rugosa***
														Alnus viridis ssp. *crispa*
(2)	(1)			(1)			(2)			(2)	(2)	(1)		***Amelanchier* spp.**
						2								*Andromeda polifolia* ssp. *glaucophylla*
						(3)								***Betula pumila***
		3				5								*Chamaedaphne calyculata*
2	2	(2)	2	2	2	(2)	2	2		2	2	2	2	***Cornus canadensis***
(2)	(2)			(2)	2									*Cornus stolonifera*
	(3)						4	4	5		4	4		***Corylus cornuta* ssp. *cornuta***
							2	(2)	2	2	3	(2)		*Diervilla lonicera*
										(3)				***Epigaea repens***
(1)		2	2	2	(1)	2				(2)			(2)	*Gaultheria hispidula*
														Gaultheria procumbens
		(3)	(2)			(1)								*Kalmia angustifolia*
		1				2								***Kalmia polifolia***
		5	4	3	(2)	4								*Ledum groenlandicum*
2	(2)		1	1	1		(1)			(2)	(2)	(2)	(1)	***Linnaea borealis* ssp. *longiflora***
(2)	(2)				2			(2)			(2)	2	(2)	*Lonicera canadensis*
				1										***Lonicera villosa***
		1	(1)	(1)		1								*Oxycoccus microcarpus*
														Prunus virginiana* ssp. *virginiana
				(2)										*Rhamnus alnifolia*

...Species Percentage Cover by Ecosite

ES	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p
Shrubs															
Ribes lacustre								(2)			(2)				
Ribes triste								(1)			(2)				
Rosa acicularis ssp. *sayi*						(2)		2	2	(2)	(2)				(2)
Rubus idaeus* ssp. *melanolasius								(2)	(2)						(2)
Rubus pubescens						(2)		2	2	2	2	(2)	(2)		2
***Salix* spp.**															
Sorbus decora	(1)	(1)		(2)	(2)		(2)	(1)	(2)	(1)	(2)	(2)	(2)		(2)
Vaccinium angustifolium	3	2	4	2	2	(2)	(2)	(2)	(1)	2				2	2
Vaccinium myrtilloides	3	(2)	3	2	2	2	2	(2)	(2)	2				2	1
Viburnum edule								(2)	(1)		(2)				
Herbs															
Anemone quinquefolia var. *quinquefolia*								(1)	1	(1)	(1)		(1)		(1)
Aralia nudicaulis		2		2			(1)	2	3	2	2	3	2		(2)
Aster ciliolatus									(1)						
Aster macrophyllus		(2)		(2)			(2)	4	3	3	4	4	3		
Clintonia borealis	(2)	2		2	(2)	(2)	(2)	2	2	2	2	2	2		2
Coptis trifolia		(1)		(2)	(2)	(1)	(2)	(2)	(1)	(1)	(1)	(1)	(1)	(2)	2
Fragaria virginiana ssp. *virginiana*								(2)	(1)						(1)
Galium triflorum								1	(1)		1	(1)	(1)		(1)
Goodyera repens							(1)		(1)						
Maianthemum canadense	1	2	(2)	2	2	(2)	2	2	2	2	1	2	2	(2)	1
Maianthemum trifolium														(1)	(2)
Mertensia paniculata									(2)						
Mitella nuda						(1)		2	(2)		2	(2)	(2)		(1)
Monotropa uniflora															

9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21	ES
														Shrubs
(2)	(2)			(1)	(1)									*Ribes lacustre*
(1)	(2)			(1)										***Ribes triste***
(1)	(2)			(1)										*Rosa acicularis* ssp. *sayi*
(3)	(2)			(2)										***Rubus idaeus* ssp. *melanolasius***
2	3		2	2	2							(1)		*Rubus pubescens*
										(2)				***Salix* spp.**
2	(2)			(1)	1		(2)	(1)		(2)	(2)	(2)	(1)	*Sorbus decora*
	(2)	2	(2)	(1)		(2)	1			3	2		(2)	***Vaccinium angustifolium***
	(2)	(2)	(2)	(1)		(2)	(1)			3	(2)		(2)	*Vaccinium myrtilloides*
	(2)				2									***Viburnum edule***
														Herbs
														Anemone quinquefolia var. *quinquefolia*
2	(2)			(2)	1		2	2	2	(2)	2	2	(2)	***Aralia nudicaulis***
				(1)										*Aster ciliolatus*
(3)	(3)						2	3	3	(2)	2	2		***Aster macrophyllus***
2	(2)		(1)	(2)	2		3	2	2	(2)	2	2	2	*Clintonia borealis*
2	(2)	(2)	2	2	1	(2)	(1)				(2)	2	2	***Coptis trifolia***
	(2)			(1)										*Fragaria virginiana* ssp. *virginiana*
1	1			1	1		(1)	1				(1)		***Galium triflorum***
(1)														*Goodyera repens*
2	2		(1)	1	1	(1)	2	2	1	2	2	2	(2)	***Maianthemum canadense***
		2	2	1	(1)	2								*Maianthemum trifolium*
(1)					(2)									***Mertensia paniculata***
2	2		(1)	2	2									*Mitella nuda*
								(1)						***Monotropa uniflora***

...Species Percentage Cover by Ecosite

ES	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p
Herbs															
Oxalis acetosella ssp. *montana*															
Petasites frigidus* var. *palmatus						(2)		2	(1)	(2)	(1)				(1)
Pyrola spp.															
Streptopus roseus								(1)	(1)	(1)	1	1	(1)		
Trientalis borealis		1		1	(1)	(1)	(1)	1	(1)	1	1	1	1		(1)
Viola renifolia															
Viola spp.		(1)				(1)		2	1	(2)	2	2	(1)		(1)
Graminoids, Ferns & Allies															
Athyrium filix-femina* ssp. *angustum															
Calamagrostis canadensis									(2)	(1)					(2)
***Carex* spp.**						(1)		(2)	(2)		(2)	(2)	(2)	(2)	2
Cinna latifolia															
Dryopteris carthusiana		(1)							(1)		(2)	(2)	(1)		
Equisetum sylvaticum						(1)		(1)	(1)					(2)	2
Gymnocarpium dryopteris								(2)			(1)				
Huperzia lucidula															
Lycopodium annotinum						(1)		(2)			(2)				
Lycopodium clavatum										(1)					
Lycopodium obscurum		(1)		(2)						(1)		(2)	(2)		
Oryzopsis asperifolia									(1)	(2)					
Pteridium aquilinum* var. *latiusculum		(2)		(3)								(4)	(2)		

9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21	ES
														Herbs
								(2)						*Oxalis acetosella* ssp. *montana*
(1)	(2)			(1)										***Petasites frigidus*** **var. *palmatus***
												(1)		*Pyrola* spp.
1	(1)				(1)		(1)	(2)				(2)	(1)	***Streptopus roseus***
1	1			1	1		1	1			2	2	2	*Trientalis borealis*
													2	***Viola renifolia***
2	2			1	2		1	(2)						*Viola* spp.
														Graminoids, Ferns & Allies
(2)														***Athyrium filix-femina*** **ssp. *angustum***
	(2)			(2)										*Calamagrostis canadensis*
2	(2)	2	2	3	3	4		(1)						***Carex*** **spp.**
					(2)									*Cinna latifolia*
2	(2)						(2)	2				(2)	(2)	***Dryopteris carthusiana***
(2)	(2)		(2)	(2)	(1)									*Equisetum sylvaticum*
1	(2)			(2)	2								(2)	***Gymnocarpium dryopteris***
												(1)		*Huperzia lucidula*
(2)														***Lycopodium annotinum***
														Lycopodium clavatum
							2	(2)	3			(2)		***Lycopodium obscurum***
														Oryzopsis asperifolia
							3		(1)	(3)	3	(2)	2	***Pteridium aquilinum*** **var. *latiusculum***

...Species Percentage Cover by Ecosite

ES	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p
Mosses & Liverworts															
Bazzania trilobata															
Brachythecium **spp.**		(2)		(2)					(2)			(2)	(2)		
Dicranum flagellare															
Dicranum fuscescens **var.** ***fuscescens***	(1)	(2)		1	(1)	(1)	1	(1)	(1)	(1)		(1)	(1)	(1)	(1)
Dicranum montanum															
Dicranum polysetum	2	(2)	2	2	2	1	3	(2)	(2)	(1)		(1)		2	1
Dicranum scoparium															
Hylocomium splendens	(3)					3	(2)	3	2	(2)	(2)			(2)	(3)
Jamesoniella autumnalis var. *autumnalis*															
Mnium **spp.**															
Plagiothecium laetum															
Plagiothecium **spp.**															
Pleurozium schreberi	5	4	6	4	6	6	6	5	4	5	2	3	3	6	5
Polytrichum commune **var.** ***commune***	(2)													(1)	
Polytrichum juniperinum															
Ptilidium ciliare	(2)				(1)									(2)	
Ptilidium pulcherrimum															
Ptilium crista-castrensis	(3)		(2)	(2)	3	3	3	3	2	2	(1)	(2)	(2)	(3)	2
Rhytidiadelphus triquetrus								(3)	(2)	(2)	(2)		(2)		
Sanionia uncinata								(1)			(1)		(1)		
Sphagnum angustifolium															
Sphagnum capillifolium	(3)					(2)								4	3
Sphagnum fuscum															
Sphagnum girgensohnii	(3)					(4)								4	4

...Species Percentage Cover by Ecosite

9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21	ES
														Mosses & Liverworts
													(2)	*Bazzania trilobata*
							2	(2)	1		(2)	1	(1)	***Brachythecium* spp.**
											(2)	(1)		*Dicranum flagellare*
(1)	(2)		(1)		1		2	(1)	1	(1)		(2)		***Dicranum fuscescens* var. *fuscescens***
													(1)	*Dicranum montanum*
(1)	(1)	2	2	(1)			(1)			2	(2)			***Dicranum polysetum***
								(2)					2	*Dicranum scoparium*
(3)			3	3	3									***Hylocomium splendens***
												(1)		*Jamesoniella autumnalis* var. *autumnalis*
			(1)	(1)	(2)				(1)			2	(1)	***Mnium* spp.**
													(1)	*Plagiothecium laetum*
												(1)		***Plagiothecium* spp.**
4	4	5	5	5	3	3	1	(1)		5	3	2	2	*Pleurozium schreberi*
								(1)				(1)		***Polytrichum commune* var. *commune***
							(1)							*Polytrichum juniperinum*
		(1)												***Ptilidium ciliare***
										(2)	(2)		(1)	*Ptilidium pulcherrimum*
3	(2)	(2)	3	2	(2)	(1)	(1)							***Ptilium crista-castrensis***
(3)	(2)			(2)	4									*Rhytidiadelphus triquetrus*
(2)				(2)										***Sanionia uncinata***
		(4)				6								*Sphagnum angustifolium*
		3	3	4	(2)	(3)							(1)	***Sphagnum capillifolium***
		3				4								*Sphagnum fuscum*
		5	4	5	4	(4)								***Sphagnum girgensohnii***

...Species Percentage Cover by Ecosite

ES	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p
Mosses and Liverworts															
Sphagnum magellanicum															(3)
Sphagnum wulfianum															(1)
Lichens															
Cladina mitis	(2)														
Cladina rangiferina	3	(1)	3	(1)	2	(2)	(1)							2	1
Cladina stellaris var. *stellaris*	(2)		3												
Cladonia chlorophaea	(1)		(1)			(1)		(1)						(1)	
Cladonia coniocraea	(1)	(1)				(1)		(1)							
Cladonia cristatella	(1)														
Cladonia spp.		(2)													

...Species Percentage Cover by Ecosite

9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21	ES
														Mosses and Liverworts
		4	4	(4)		4								*Sphagnum magellanicum*
			(2)											***Sphagnum wulfianum***
														Lichens
														Cladina mitis
		2	2	(1)		(1)				3			(2)	***Cladina rangiferina***
														Cladina stellaris var. *stellaris*
		(1)	(1)											***Cladonia chlorophaea***
		(1)	(1)					(1)						*Cladonia coniocraea*
														Cladonia cristatella
							(1)							*Cladonia* spp.

Percentage of Vegetation Type by Ecosite

ES: V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
ES 1p							2									5	7	17	2	24	15	15	5	2		2	2	
ES 1r	14	21		7		14	14	7			7						14											
ES 2																	2	24		2	73							
ES 3		3		4		20	17	45									3	1	4	3								
ES 4							3	3									16	12	2	47	3	6		3		3	2	
ES 5f								6							9	6	3		3	14		6	26	17		6	6	
ES 5m							4	12								4	12	4	12	35			4				15	
ES 6f								9		1	12	14	12		39	4	1		1	1			4					
ES 6m	4				4			21		8	4	8	17		17				8				8					
ES 6c				8				69			2	2	2		8			2	6									
ES 7f		1		10	16		1			29	20	7	10		1	3												
ES 7m	8	4		13	19	4	4	21	4	10	8	2				2												
ES 7c	9	6		35	22			4	2	4	6	2	2		2	7												
ES 8																	2	2	4	8		8	11	15		21	30	
ES 9p							3								3	3	3			5			32	29	21	3		
ES 9r	7			4			4	7	15	11			4		11	37												
ES 10				6	1		3	9	2	10	6	6	30	4	13		1		3	2			2					
ES 11																								2		73	16	8
ES 12																			1				10	54	16	9	8	1
ES 13p															5	9							14	21	50			
ES 13r									7					7		60							7		20			
ES 14																									6	6		88
ES 15		36		64																								
ES 16	29	50	7	14																								
ES 17	14		86																									
ES 18		14				9	9	5									14	32		5	14							
ES 19		11		36		21	21	7									4											
ES 20	27	27		36						9																		
ES 21	25	13		13				25												25								

→ Read in this direction for percent totals (may not always equal 100 due to rounding).

Ecosite Photographs

This section presents photographs of the typical vegetation cover in each of the ecosites.

ES 1p Black Spruce – Jack Pine – Very Shallow Soil – Species Poor

ES 1r White Spruce – White Birch – Very Shallow Soil – Species Rich

ES 2 Jack Pine –
Coarse Soil

ES 3 White Birch – Trembling Aspen –
Black Spruce – Coarse Soil

ES 4 Black Spruce – Jack Pine –
Coarse Soil

ES 5f Black Spruce –
Fine Soil

ES 5m Black Spruce –
Medium Soil

ES 6f Black Spruce –
Trembling Aspen – Fine Soil

ES 6m Trembling Aspen – Black Spruce – Balsam Fir – Medium Soil

ES 6c Trembling Aspen – Black Spruce – Jack Pine – Coarse Soil

ES 7f Trembling Aspen – White Spruce – White Birch – Fine Soil

ES 7m Trembling Aspen – White Birch – Medium Soil

ES 7c Trembling Aspen –
White Birch – Coarse Soil

ES 8 Black Spruce – Feathermoss –
Sphagnum – Moist Soil

ES 9p Black Spruce – Larch – Moist Soil – Species Poor

ES 9r White Spruce – Balsam Fir – White Cedar – Moist Soil – Species Rich

ES 10 Trembling Aspen – Black Spruce – Balsam Poplar – Moist Soil

ES 11 Black Spruce – Labrador-tea – Organic Soil

ES 12 Black Spruce – Larch – Labrador-tea – Organic Soil

ES 13p Black Spruce – Larch – Speckled Alder – Organic Soil – Species Poor

ES 13r White Cedar – Black Spruce – Organic Soil – Species Rich

ES 14 Black Spruce – Leatherleaf – Organic Soil

ES 15 Red Maple

ES 16 Yellow Birch

ES 17 Sugar Maple

ES 18 Jack Pine –
White Pine – Red Pine

ES 19 White Pine –
Red Pine – Mixedwood

ES 20 White Pine –
Hardwood Mixedwood

ES 21 White Pine –
Coniferous Mixedwood

Introduction to Landscape Diagrams

Ecosites describe specific ranges of soil features and the typical associated vegetation. These soil and vegetation features occur in complex patterns across the landscape. Each landform is associated with a unique distribution of soil conditions, and to a lesser extent, associated vegetation. These often occur in repeating and predictable patterns across a landform condition, associated with changes in topography. This section contains diagrams showing the typical distribution of ecosites, soil and vegetation types, stand conditions, and soil features across topographic gradients associated with different landform patterns. These diagrams are provided for five landscapes that are commonly found in northeastern Ontario:

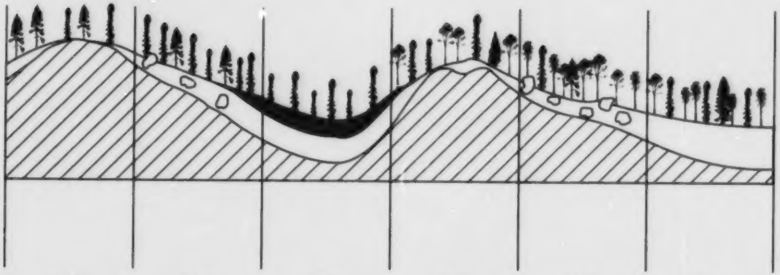
- shallow sandy to coarse loamy till
- deep sandy to coarse loamy glaciofluvial material
- deep coarse loamy to silty till,
- deep fine loamy to clayey lacustrine material
- organic materials

The landscape sequences are based on mapping information collected while testing the revised ecosite and vegetation type field keys, and represent typical examples chosen from actual landscapes in northeastern Ontario. On these diagrams, the vegetation and soil types corresponding with the ecosites represent commonly occurring landscape patterns. Note that many other ecosite/soil type/vegetation type combinations can occur.

Inventory and mapping of forest ecosystems allows management interpretations to be transferred to the forest land base. The spatial distribution of ecosites, and vegetation and soil types across the landscape is important in understanding ecosystem function, which is critical to the development of ecosystem-oriented prescriptions.

Shallow Sandy to Coarse Loamy Till Landscape

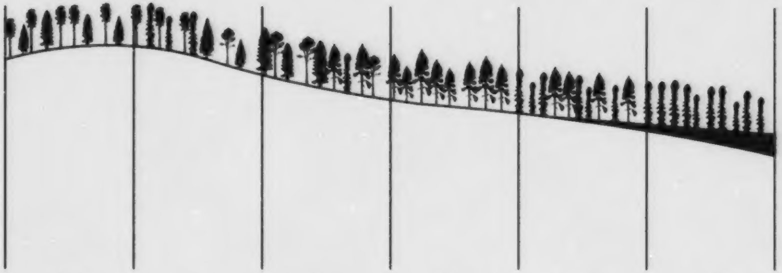
Tree species:	Pj-Sb (sparse)	Sb-(Pj)	Sb	Bw-Sb-(Bf)	Bw-Pt- (Pj-Sb)	Pt-Sb- (Bw-Sw)
Ecosites:	ES 1p	ES 4	ES 8	ES 1r	ES 3	ES 6c



Typical vegetation types:	V 18	V 20	V 27	V 7	V 6	V 8
Typical soil types:	SS 1	S 5	S 16	SS 3	S 5	S 5
Moisture regime:	dry	fresh	moist	dry	fresh	fresh
Humus form:	fibrimor	fibrimor	fibric peaty mor	fibrimor	fibrimor	moder

Deep Sandy to Coarse Loamy Glaciofluvial Landscape

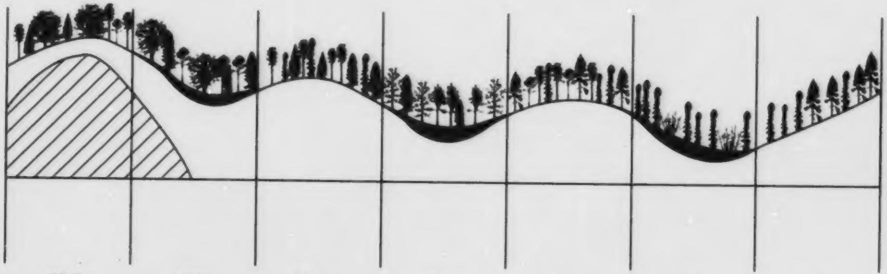
Tree species:	Pt-(Sw-Bf)	Pt-Sb-(Bf-Bw)	Bw-Pt-Pj-(Sb)	Pj	Sb-Pj	Sb
Ecosites:	ES 7c	ES 6c	ES 3	ES 2	ES 4	ES 8



Typical vegetation types:	V 4	V 8	V 6	V 21	V 17	V 27
Typical soil types:	S 3	S 1	S 1	S 1	S 3	S 16
Moisture regime:	fresh	fresh	fresh	fresh	fresh	moist
Humus form:	fibrimor	fibrimor	fibrimor	fibrimor	fibrimor	fibric peaty mor

Deep Coarse Loamy to Silty Till Landscape

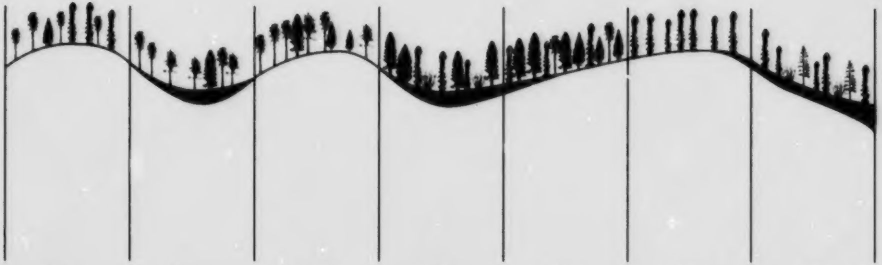
Tree species:	Mr-Pt-Bf-(Bw)	By-Bw-Sw	Pt-Sb-(Sw-Bf)	Pb-Sw-(Ab)	Pt-Pj-Sb-Bw	Sb	Sb-Pj
Ecosites:	ES 15	ES 16	ES 7m	ES 10	ES 6m	ES 9p	ES 5m



Typical vegetation types:	V 4	V 2	V 11	V 13	V 8	V 24	V 17
Typical soil types:	S 9	S 12	S 10	S 15	S 9	S 16	S 9
Moisture regime:	fresh	fresh	fresh	moist	fresh	moist	fresh
Humus form:	fibrimor	moder	humimor	moder	fibrimor	humic peaty mor	fibrimor

Deep Fine Loamy to Clayey Lacustrine Landscape

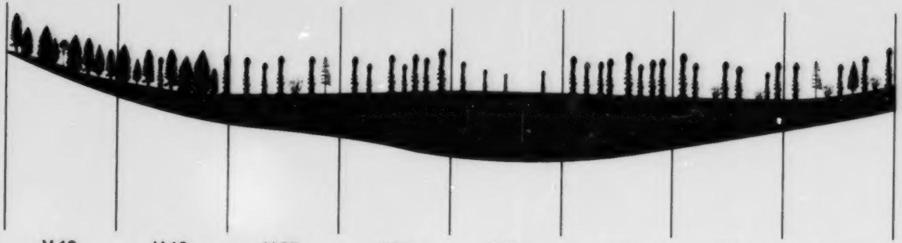
Tree species:	Pt-Sb-(Bf)	Pb-Pt-(Sw)	Pt-(Pb-Bf-Sw)	Sw-Sb-Ce	Sb-Bf-Sw-(Pt)	Sb	Sb-(L)
Ecosites:	ES 7f	ES 10	ES 7f	ES 9r	ES 6f	ES 5f	ES 9p



Typical vegetation types:	V 11	V 13	V 10	V 16	V 15	V 20	V 23
Typical soil types:	S 13	S 15	S 13	S 16	S 13	S 13	S 16
Moisture regime:	fresh	moist	fresh	moist	fresh	fresh	moist
Humus form:	humimor	mull	fibrimor	humic peaty mor	fibrimor	fibrimor	fibric peaty mor

Organic Landscape

Tree species:	Sw-Ce-Bf-(Bw)	Ce-Sw-Sb-(Bf)	Sb-(L)	Sb	Sb (stunted. sparse)	Sb	Sb	Sb-(Bf-L)
Ecosites:	ES 9r	ES 13r	ES 12	ES 11	ES 14	ES 11	ES 12	ES 13p



Typical vegetation types:	V 16	V 16	V 25	V 27	V 28	V 26	V 24	V 23
Typical soil types:	S 16	S 19	S 18	S 17	S 17	S 17	S 17	S 18
Moisture regime:	moist	wet	wet	wet	wet	wet	wet	wet
Humus form:	humimor	humic peaty mor	mesic peaty mor	fibric peaty mor	fibric peaty mor	fibric peaty mor	fibric peaty mor	mesic peaty mor

Typical Ecosite Landform Associations

ES	Mode of Deposition	Typical Landforms
1p	Shallow morainal drift	Shallow tills over bedrock on bedrock knobs, ridges or plateaus
1r	Shallow morainal drift	Shallow tills over bedrock on bedrock knobs, ridges or plateaus
2	Glaciofluvial, eolian	Outwash plains, deltas, eskers, esker complexes, sand dunes, kames, beaches
3	Glaciofluvial, morainal	Outwash, deltas, eskers, esker/kame complexes, ablation till, ground moraine, end moraine; sometimes on stratified soils, often along boundaries between landforms
4	Glaciofluvial, eolian	Outwash plains, deltas, eskers, kames, esker/kame complexes, sand dunes, beaches, usually in lower slope positions
5f	Lacustrine (morainal)	Glaciolacustrine or clay till plains, undulating drumlinoid formations
5m	Morainal (lacustrine)	Ground moraine, ablation till, end moraine, silty glaciolacustrine deposits
6f	Lacustrine (morainal)	Glaciolacustrine or clay till plains, undulating drumlinoid formations
6m	Morainal (lacustrine)	Ground moraine, ablation till, end moraine; silty glaciolacustrine or alluvial (riverine) deposits
6c	Glaciofluvial (morainal)	Outwash plains, eskers or kames, esker/kame complexes, beaches, end moraine, ablation till, ground moraine
7f	Lacustrine (morainal)	Glaciolacustrine or clay till plains, undulating drumlinoid formations
7m	Morainal (lacustrine)	Ground moraine, ablation till, end moraine, silty glaciolacustrine or alluvial (riverine) deposits
7c	Glaciofluvial, morainal (lacustrine)	Outwash plains, eskers or kames, esker/kame complexes, beaches, end moraine, coarse textured ablation till or ground moraine; sandy lakebed deposits
8	Various	Poorly drained peaty soils on a variety of materials and landforms, on lower slope positions in gently sloping terrain

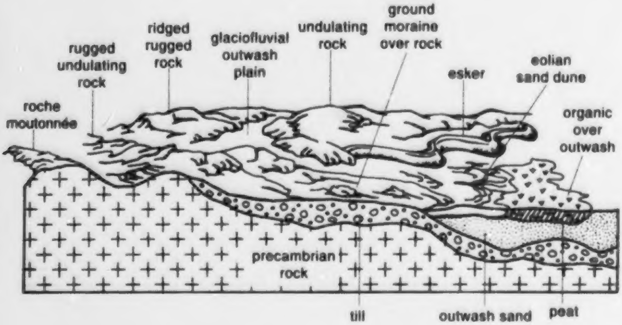
...Typical Ecosite Landform Associations

ES	Mode of Deposition	Typical Landforms
9p	Various	Poorly drained soils, often peaty, on lower slopes on a variety of materials and landforms
9r	Various	Poorly drained soils, often peaty, on lower slopes on a variety of materials and landforms
10	Lacustrine, morainal (glaciofluvial)	Glaciolacustrine silts and clays or clay tills, silt pockets in morainal or glaciofluvial complexes
11	Organic	Moderately deep to deep fibric or mesic organic soils, in flat terrain
12	Organic	Moderately deep to shallow mesic organic soils, usually associated with drainageways
13p	Organic	Shallow humic organic soils, associated with strong drainage (toe of steep slopes, bottom of valleys, adjacent to drainageways)
13r	Organic	Shallow humic organic soils, associated with strong drainage (toe of steep slopes, bottom of valleys, adjacent to drainageways)
14	Organic	Deep fibric organic soils, in flat terrain or depressions
15	Morainal (glaciofluvial)	Typically on till materials on ridge or hill tops
16	Morainal, glaciofluvial	Ablation till, ground moraine, end moraine, outwash planes, deltas, esker and kame complexes
17	Morainal, glaciofluvial	Ablation till, ground moraine, fine outwash, deltas, silty lacustrine deposits
18	Glaciofluvial, morainal (aeolian)	Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraine, shallow till veneer over bedrock, sand dunes
19	Glaciofluvial, morainal	Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraine
20	Morainal, glaciofluvial (lacustrine)	Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraine, sandy lake plains
21	Glaciofluvial, morainal	Glaciofluvial outwash, eskers, kames, ground moraine, ablation till, end moraine

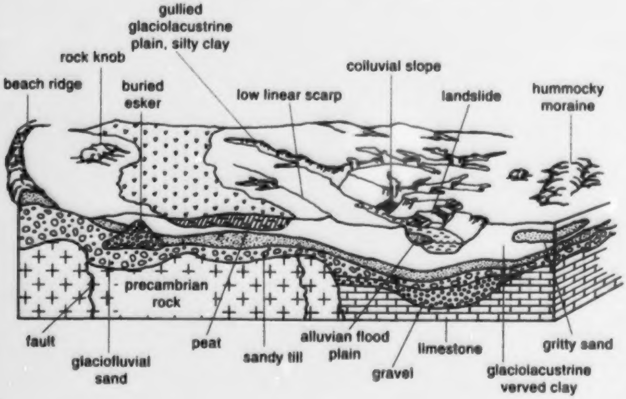
Note: Brackets mean occassional.

Typical Terrain Types of Northeastern Ontario

Non-Clay Belt areas of the Northeastern Region


ground moraine over rock
ridged rugged rock
undulating rock
glaciofluvial outwash plain
rugged undulating rock
eolian sand dune
esker
organic over outwash
roche moutonnée
precambrian rock
till
outwash sand
peat

Clay Belt areas of the Northeastern Region


gullied glaciolacustrine plain, silty clay
rock knob
colluvial slope
beach ridge
buried esker
low linear scarp
landslide
hummocky moraine
precambrian rock
fault
peat
alluvial flood plain
limestone
gritty sand
glaciofluvial sand
sandy till
gravel
glaciolacustrine verved clay

Adapted from Gartner *et al.* 1981

Ecosite Mapping Concepts

Ecosites can be mapped by using features that are readily observed and interpreted on air photographs, or using other remote sensing methods. These features are used to predict the distribution of soil and vegetation features, which in turn describe a likely range of ecosites within a mapped polygon. The logistics of inventory dictate that maps are based on features readily observed and verified using remote sensing techniques appropriate to the scale of the inventory. When carefully chosen, these features carry accessory information that provide high predictive value for the attributes of interest to the inventory. The selection of attributes to be interpreted is dependent on the purpose of the survey and the decisions or assessments to be made based on the inventory data. The choice of mapping features is dependent on the attributes that need to be interpreted.

Sampling to verify and quantify the relationships between the mapping features and the attributes of interest to the survey is costly and time consuming. It is important, therefore, that the sampling design be efficient. Inventory and mapping should involve recording the features used to predict ecological land attributes, as well as the ecological classes (ecosites) or the attributes predicted. Associated databases consist of recorded mapping features for each polygon, in addition to the ecological classes, and a link to the site data used to construct the classes. This approach provides the flexibility needed to reclassify the map for different purposes or to develop interpretations against the highest level of detail available.

The reliability of the mapping is a function of the quality of the mapping and how well the mapping features predict the attributes of interest. Determining map reliability is an independent process and should be conducted after the mapping is completed. As with the sampling strategy, mapping effort should be stratified to concentrate field efforts in those areas of highest priority or sensitivity. This will result in maps with different levels of reliability in different areas. Field verification of remotely sensed map polygons can be conducted using a combination of aerial, road and foot traverses. All traverses should be mapped and consistency with mapped features and classes recorded. This will provide a qualitative indication of map reliability. The need for more formal reliability procedures depends on the attributes mapped and the intended use of the maps and should be determined during the problem analysis and planning sessions.

The utility of the inventory will be dependent on the content and design of the associated database. For example, all data related to a polygon should be recoverable as should the relationship of the data to the polygon. This may include mapping features of the polygon, associated ecosites, sites sampled within the polygon, sites and locations sampled to define the primary ecosite attached to the polygon, and the algorithm or classification procedure used to classify the polygon. This allows all of the detail and precision of data collected for the inventory to be retained while providing the ecological classification(s) and generalizations needed in the planning process.

Existing inventories, such as the Forest Resource Inventory and soil or landform maps, often describe attributes the same as or similar to those used to describe ecosites. The primary information contained in the databases for these inventories may be useful in predicting the distribution of ecosites across the landscape, or as a stratification mechanism for a field sampling program. The utility of these inventories for this purpose will depend on the native scale and reliability of the maps, the mapping methods used, and the ecological attributes or classes used to define the map legends. These factors should be carefully evaluated during the planning phase.

The hierarchical approach to classification and mapping provides a basis for a statistically sound stratified sampling design. In a nested sampling design, each sample will be applicable to each level of the classification and can be used to identify the reliability with which the chosen mapping features can predict the specific attributes of interest to the inventory at different scales. A combination of stratified sampling, multiple classification options, and the associated relational database will provide the most statistically powerful and flexible inventory.

A program for inventory and mapping of ecological features and ecosites should consider the following:

- a problem analysis to determine the decisions to be made using the maps, the criteria and soil/vegetation features used to make the decisions, the relationship of these features to features that are readily observed and verified on remote sensing imagery, the desired level of reliability of the inventory, and the appropriate scale for mapping
- development of a stratified sampling design incorporating the selected ecological features
- documentation of the methods used to predict ecosite relationships with mapped features (e.g. algorithm or model, based on data relationships or local expert knowledge)
- a critical evaluation of the utility of existing inventories for predicting soil, vegetation and ecosite relationships
- stratified design for map verification and reliability testing
- relational database design, and map legend design and presentation

Introduction to Vegetation Types

This section contains fact sheets for each of the 28 NE-FEC vegetation types and a species percentage cover by vegetation type table.

The vegetation type fact sheets provide detailed information on the occurrence and abundance of plant species, vegetation structural characteristics, and on the distribution of soil and site features. The vegetation species composition table is a detailed list of the occurrence and abundance of plant species within each vegetation type. Use the fact sheets and the species composition table to check the accuracy of vegetation type determinations made using the vegetation type key, and as reference material in developing applications, such as wildlife habitat suitability.

The vegetation type names highlight relevant features of the overstorey and understorey. The vegetation type descriptions on the fact sheets list predominant vegetation, soil and forest floor features. Use the descriptions as a quick reference in comparing the characteristic features of different vegetation types.

The vegetation type by ecosite table (page C 50) is an interpretive tool. Use this table when interpreting maps and inventories of NE-FEC ecosites, to determine the relationships between vegetation types and ecosites across a landscape.

Vegetation Type Names

Hardwood/Mixedwood – Species Poor

V 1	White Birch – White Spruce
V 2	White Birch – Mountain Maple
V 3	Sugar Maple
V 4	Trembling Aspen – Beaked Hazel
V 5	Trembling Aspen – Bush Honeysuckle – Large-leaved Aster
V 6	Trembling Aspen – White Birch – Beaked Hazel – Bracken Fern
V 7	White Birch – Black Spruce – Blueberry
V 8	Trembling Aspen – Black Spruce – Herb Poor

Hardwood/Mixedwood – Species Rich

V 9	Black Ash – Speckled Alder – Sedge
V 10	Trembling Aspen – Balsam Poplar – Speckled Alder
V 11	Trembling Aspen – Black Spruce – Bush Honeysuckle – Herb Rich
V 12	Trembling Aspen – White Spruce – Squashberry
V 13	Balsam Poplar – Trembling Aspen – Mountain Maple – Ferns

Spruce/Cedar – Species Rich

V 14	White Cedar – White Spruce – Mountain Maple – Ferns
V 15	Black Spruce – Herb Rich
V 16	White Cedar – Spruce – Balsam Fir – Ferns

Jack Pine/Black Spruce – Upland

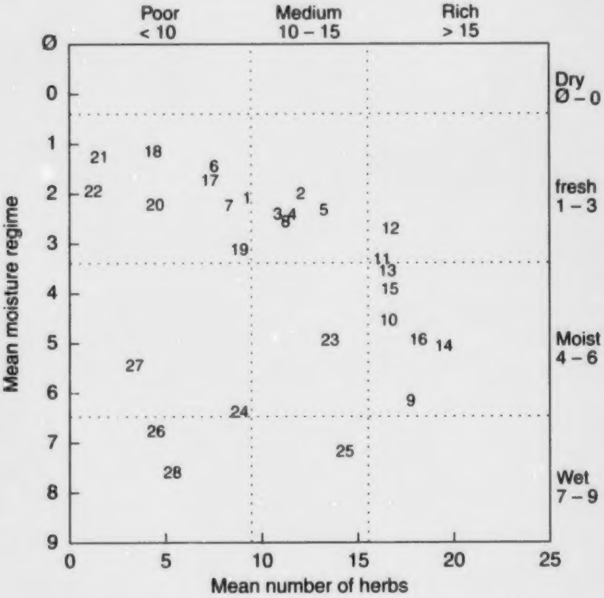
V 17	Jack Pine – Black Spruce – Feathermoss
V 18	Jack Pine – Black Spruce – Blueberry
V 19	Black Spruce – Stair-step Moss
V 20	Black Spruce – Jack Pine – Feathermoss
V 21	Jack Pine – Blueberry – Feathermoss – Lichen
V 22	Black Spruce – Jack Pine – Feathermoss – Lichen

Black Spruce – Lowland

V 23	Black Spruce – Labrador-tea – Speckled Alder – Stair-step Moss
V 24	Black Spruce – Speckled Alder – Labrador-tea – Sphagnum
V 25	Black Spruce – Larch – Speckled Alder – Stair-step Moss
V 26	Black Spruce – Leatherleaf – Sphagnum
V 27	Black Spruce – Labrador-tea – Feathermoss – Sphagnum
V 28	Black Spruce – Bog Rosemary – Pale Laurel – Sphagnum

Vegetation Type Diagram

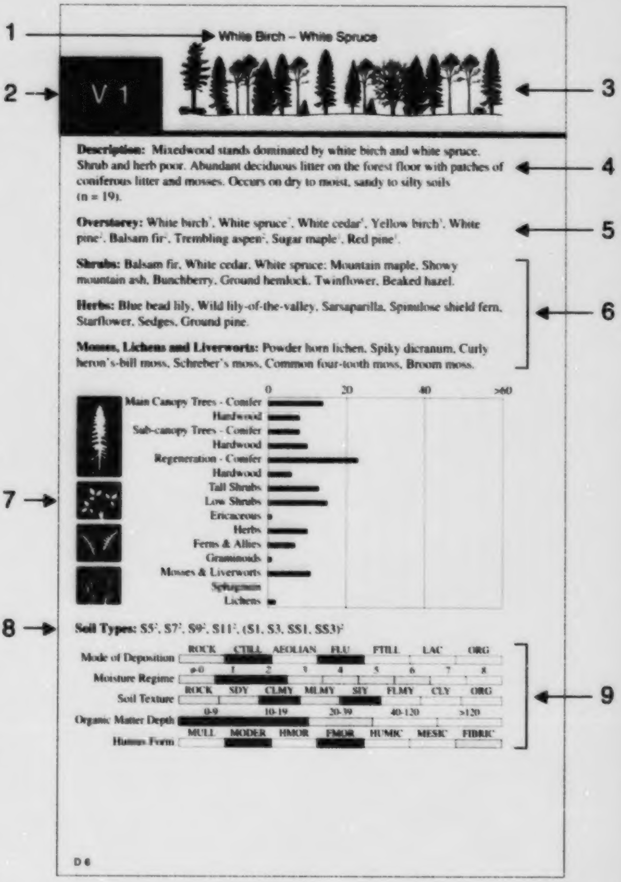
The vegetation type diagram plots average values for each vegetation type on axes of soil moisture regime and the number of herb species. Each vegetation type occurs across a range of values for moisture regime and for the number of herb species. These ranges are not shown on the diagram. Only the average (or "modal") condition is shown for each vegetation type. The purpose of the vegetation type diagram is to provide a simple, two-dimensional framework for displaying interpretive material that can be related to the vegetation types.



Vegetation Type Fact Sheet Explanation

1. **Vegetation Type Name:** a name chosen to highlight visually distinct vegetation features.
2. **Vegetation Type Number:** provides a quick reference.
3. **Stand Structure Silhouette:** a representation of the composition and structure of a typical vegetation type cross section.
4. **Description:** a general text description indicating the dominant overstorey, understorey, soil and forest floor characteristics, as well as any additional characteristics or unique features. Sample sizes are shown in brackets.
5. **Overstorey:** a listing of the tree species, ranked by frequency of occurrence in the sample (e.g. Black spruce^7 indicates that black spruce occurred in 70 percent of the samples).
6. **Understorey:** a listing of the shrubs, herbs (including ferns, fern allies and graminoids), mosses and liverworts, and lichens, in descending order of percent cover. Tree shrubs are separated from other shrubs by a semi-colon. All the species listed occurred on more than 40 percent of the sample plots.
7. **Vegetation Structure Diagrams:** A visual representation of the average percent cover of vegetation in different life form groups: hardwood and coniferous trees in the main canopy, sub-canopy and regeneration layers; tall, low and ericaceous shrubs; herbs, ferns and fern allies, and graminoids (grasses, sedges and rushes); mosses and liverworts, sphagnum mosses and lichens.
8. **Soil Types:** a listing of the soil types, ranked by frequency of occurrence in the sample. (e.g. S1^3 indicates that soil type S1 occurred in 30 percent of the samples).
9. **Soil Feature Histograms (Mode of Deposition, Soil Texture, Moisture Regime, Organic Matter Depth and Humus Form):** a visual representation of the frequency of occurrence in the sample, for these soil features. Darker = more frequent.

...Vegetation Type Fact Sheet Explanation



White Birch – White Spruce

V 1

Description: Mixedwood stands dominated by white birch and white spruce. Shrub and herb poor. Abundant deciduous litter on the forest floor with patches of coniferous litter and mosses. Occurs on dry to moist, sandy to silty soils (n = 19).

Overstorey: White birch^{1}, White spruce^{1}, White cedar^{1}, Yellow birch^{1}, White pine^{2}, Balsam fir^{2}, Trembling aspen^{2}, Sugar maple^{1}, Red pine^{1}.

Shrubs: Balsam fir, White cedar, White spruce; Mountain maple, Showy mountain ash, Bunchberry, Ground hemlock, Twinflower, Beaked hazel.

Herbs: Blue bead lily, Wild lily-of-the-valley, Sarsaparilla, Spinulose shield fern, Starflower, Sedges, Ground pine.

Mosses, Lichens and Liverworts: Powder horn lichen, Spiky dicranum, Curly heron's-bill moss, Schreber's moss, Common four-tooth moss, Broom moss.

0
20
40
>60
Main Canopy Trees - Conifer
Hardwood
Sub-canopy Trees - Conifer
Hardwood
Regeneration - Conifer
Hardwood
Tall Shrubs
Low Shrubs
Ericaceous
Herbs
Ferns & Allies
Graminoids
Mosses & Liverworts
Sphagnum
Lichens

Soil Types: S5^{2}, S7^{2}, S9^{2}, S11^{2}, (S1, S3, SS1, SS3)^{F}

Mode of Deposition
ROCK
CTILL
AEOLIAN
FLU
FTILL
LAC
ORG
Moisture Regime
d-0
1
2
3
4
5
6
7
8
Soil Texture
ROCK
SDY
CLMY
MLMY
SIY
FLMY
CLY
ORG
Organic Matter Depth
0-9
10-19
20-39
40-120
>120
Humus Form
MULL
MODER
HMOR
FMOR
HUMIC
MESIC
FIBRIC

D 6

V 1

White Birch – White Spruce

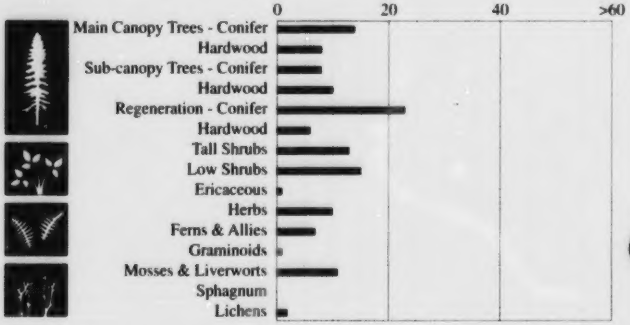
Description: Mixedwood stands dominated by white birch and white spruce. Shrub and herb poor. Abundant deciduous litter on the forest floor with patches of coniferous litter and mosses. Occurs on dry to moist, sandy to silty soils (n = 19).

Overstorey: White birch^{7}, White spruce^{7}, White cedar^{5}, Yellow birch^{1}, White pine^{2}, Balsam fir^{2}, Trembling aspen^{2}, Sugar maple^{1}, Red pine^{1}.

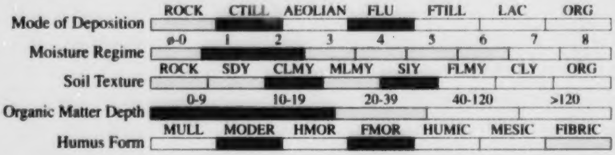
Shrubs: Balsam fir, White cedar, White spruce; Mountain maple, Showy mountain ash, Bunchberry, Ground hemlock, Twinflower, Beaked hazel.

Herbs: Blue bead lily, Wild lily-of-the-valley, Sarsaparilla, Spinulose shield fern, Starflower, Sedges, Ground pine.

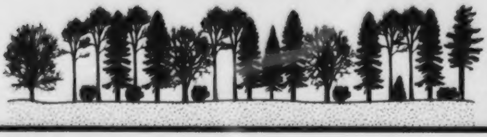
Mosses, Lichens and Liverworts: Powder horn lichen, Spiky dicranum, Curly heron's-bill moss, Schreber's moss, Common four-tooth moss, Broom moss.



Soil Types: S5^{2}, S7^{2}, S9^{2}, S11^{2}, (S1, S3, SS1, SS3)^{2}.



White Birch – Mountain Maple



V 2

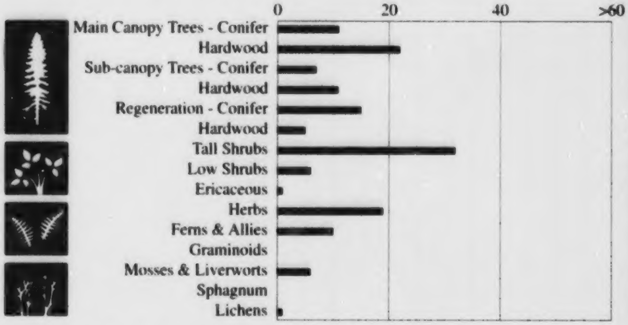
Description: Mixedwood stands dominated by white birch. Medium number of shrubs and herbs. Clubmoss species common. Abundant deciduous litter on the forest floor with sparse patches of mosses. Occurs mainly on fresh, sandy to silty soils (n = 23).

Overstorey: White birch^{8}, White spruce^{7}, Yellow birch^{3}, Balsam fir^{3}, Red maple^{3}, White pine^{2}, Trembling aspen^{1}, White cedar^{1}.

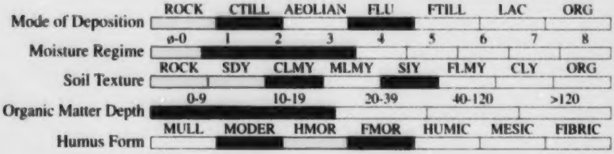
Shrubs: Balsam fir, White spruce, White birch; Mountain maple, Bunchberry, Canada honeysuckle, Bush honeysuckle, Beaked hazel, Early low blueberry, Showy mountain ash.

Herbs: Blue bead lily, Wild lily-of-the-valley, Sarsaparilla, Starflower, Spinulose shield fern, Large-leaved aster, Ground pine, Rose twisted-stock, Violets, Goldthread, Bracken fern, Shining clubmoss, Interrupted clubmoss.

Mosses, Lichens and Liverworts: Schreber's moss, Curly heron's-bill moss, Powder horn lichen, *Brachythecium* spp.



Soil Types: S5^{3}, S9^{2}, SS3^{2}, S11^{1}, (others)^{2}.



Sugar Maple

V 3

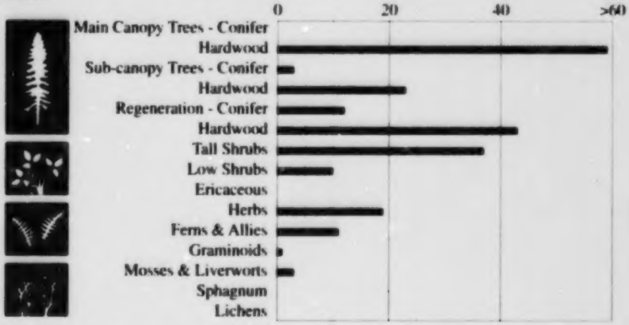
Description: Hardwood stands dominated by sugar maple. Shrub poor with a medium number of herbs. Abundant sugar maple regeneration, and tall shrubs, including mountain maple and beaked hazel, in understorey. Clubmoss species common. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh, coarse loamy to silty soils. Found in the southern part of Northeast Region in Site Region 4E (n = 7).

Overstorey: Sugar maple[7], Trembling aspen[2], Yellow birch[3], White spruce[3], Balsam fir[1], White birch[1].

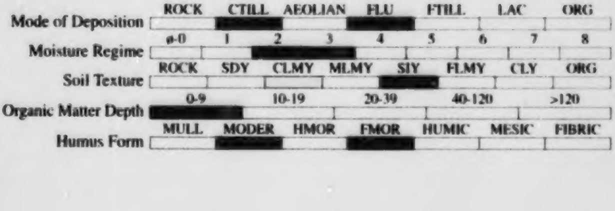
Shrubs: Sugar maple, Balsam fir, White spruce, Trembling aspen, Yellow birch; Mountain maple, Beaked hazel, Bush honeysuckle, Choke cherry.

Herbs: Ground pine, Large-leaved aster, Spinulose shield fern, Blue bead lily, Sarsaparilla, Starflower, Rose twisted-stock, Shining clubmoss, Wild lily-of-the-valley, Bracken fern, Fragrant bedstraw, Sedges.

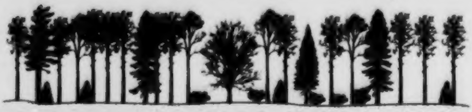
Mosses, Lichens and Liverworts: *Brachythecium* spp., Curly heron's-bill moss.



Soil Types: S9[6], S11[3], S7[1].



Trembling Aspen – Beaked Hazel



V 4

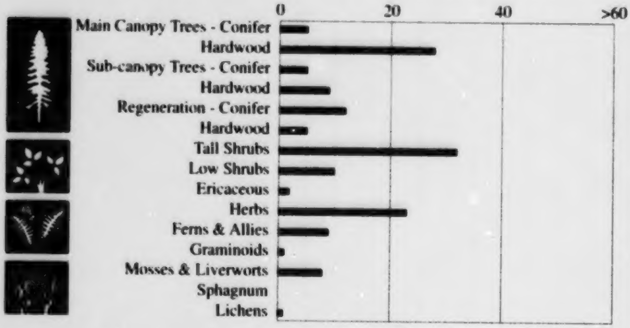
Description: Hardwood mixedwood stands dominated by trembling aspen. Medium number of shrubs and herbs. Abundant tall shrubs including mountain maple and beaked hazel. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh to moist, sandy to fine loamy soils (n = 57).

Overstorey: Trembling aspen^9, White birch^6, Balsam fir^4, White spruce^4, Red maple^2, White pine^1.

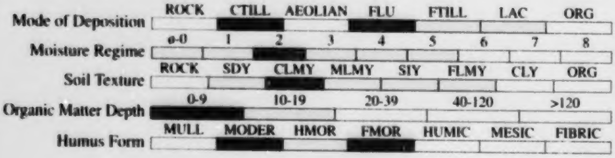
Shrubs: Balsam fir, Trembling aspen, White birch, White spruce; Mountain maple, Beaked hazel, Bunchberry, Bush honeysuckle, Early low blueberry, Twinflower, Showy mountain ash, Canada honeysuckle, Dwarf raspberry.

Herbs: Blue bead lily, Wild lily-of-the-valley, Sarsaparilla, Large-leaved aster, Ground pine, Starflower, Bracken fern, Violets, Rose twisted-stock, Goldthread.

Mosses, Lichens and Liverworts: Schreber's moss, Curly heron's-bill moss.

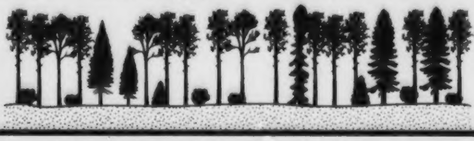


Soil Types: S5^3, S1^1, S9^1, S11^1, S13^1, (others)^3.



Trembling Aspen – Bush Honeysuckle – Large-leaved Aster

V 5



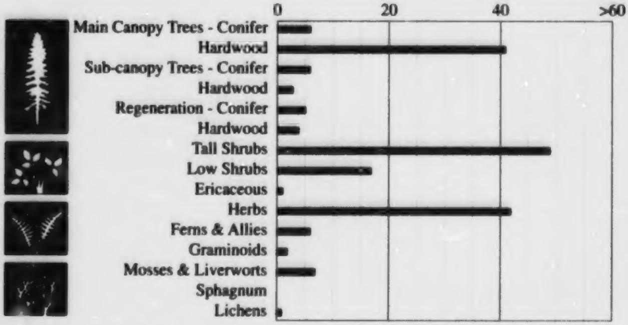
Description: Hardwood stands dominated by trembling aspen. Medium number of shrubs and herbs. Abundant tall shrubs, including mountain maple, beaked hazel, Canada honeysuckle and serviceberries. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh soils of various textures (n = 34).

Overstorey: Trembling aspen^{10}, White spruce^4, Balsam fir^4, White birch^4, Black spruce^2.

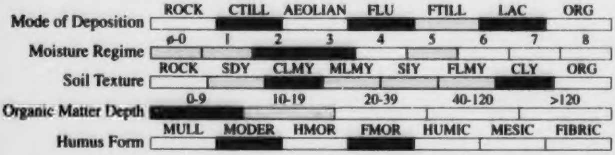
Shrubs: Balsam fir, Trembling aspen, White birch; Beaked hazel, Bush honeysuckle, Dwarf raspberry, Mountain maple, Canada honeysuckle, Serviceberries, Bunchberry, Bristly wild rose.

Herbs: Blue bead lily, Wild lily-of-the-valley, Large-leaved aster, Sarsaparilla, Rose twisted-stalk, Violets, Ground pine, Starflower, Fragrant bedstraw, Wood anemone, Bracken fern.

Mosses, Lichens and Liverworts: Schreber's moss, *Brachythecium* spp.



Soil Types: S13^3, S2^1, S7^1, S9^1, S10^1, S12^1, (others)^2.



Trembling Aspen – White Birch – Beaked Hazel – Bracken Fern

V 6

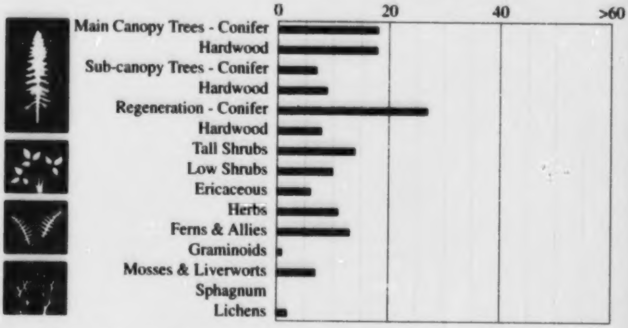
Description: Mixedwood stands dominated by trembling aspen and white birch; common associates include jack pine, spruces and balsam fir. Medium number of shrubs, herb poor. Forest floor mainly deciduous leaf litter with patches of coniferous litter. Occurs mainly on dry to fresh, sandy to coarse loamy soils (n = 19).

Overstorey: Trembling aspen^{8}, White birch^{8}, Jack pine^{5}, White spruce^{5}, Black spruce^{4}, Balsam fir^{4}, Red pine^{3}, White pine^{2}, Red maple^{1}, Largetooth aspen^{1}.

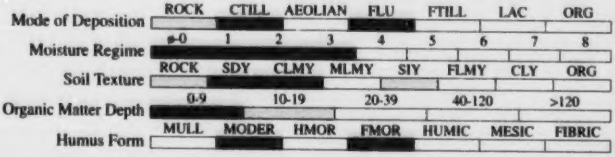
Shrubs: Balsam fir, Black spruce, White birch, Trembling aspen, White spruce; Bunchberry, Velvetleaf blueberry, Bush honeysuckle, Early low blueberry, Twinflower, Beaked hazel, Mountain maple, Serviceberries.

Herbs: Wild lily-of-the-valley, Sarsaparilla, Bracken fern, Blue bead lily, Large-leaved aster, Starflower.

Mosses, Lichens and Liverworts: Wavy-leaved moss, Curly heron's-bill moss, Schreber's moss, *Brachythecium* spp., Reindeer lichen, *Cladonia* spp.



Soil Types: S1^{4}, S5^{2}, S7^{1}, S9^{1}, SS3^{1}, (others)^{1}.



White Birch – Black Spruce – Blueberry

V 7

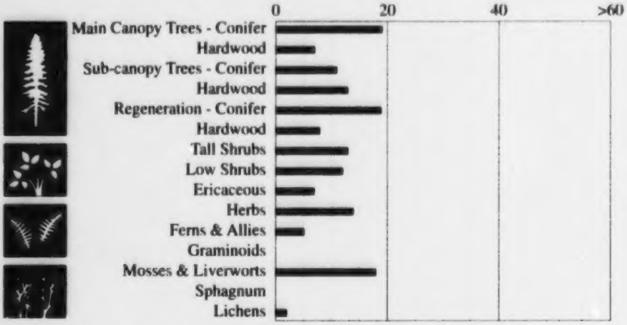
Description: Mixedwood stands dominated by white birch and black spruce. Medium number of shrubs, herb poor. Forest floor consists mainly of deciduous and coniferous leaf litter with scattered patches of feathermosses. Occurs mainly on dry to moist, sandy to silty soils (n = 29).

Overstorey: White birch^{10}, Black spruce^{7}, Balsam fir^{5}, White spruce^{5}, Jack pine^{4}, Trembling aspen^{3}, White pine^{1}, Red maple^{1}.

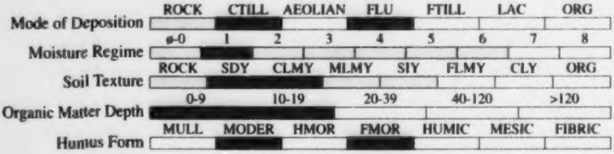
Shrubs: Balsam fir, Black spruce, White birch, Red maple, White spruce; Early low blueberry, Bunchberry, Twinflower, Showy mountain ash, Velvetleaf blueberry, Bush honeysuckle, Creeping snowberry, Mountain maple, Serviceberries.

Herbs: Blue bead lily, Wild lily-of-the-valley, Goldthread, Starflower, Bracken fern, Sarsaparilla, Ground pine, Large-leaved aster.

Mosses, Lichens and Liverworts: Schreber's moss, Curly heron's-bill moss, Wavy-leaved moss, Reindeer lichen, *Cladonia* spp., *Brachythecium* spp.



Soil Types: S1^{3}, S11^{2}, S7^{1}, S5^{1}, SS3^{1}, (others)^{2}.



Trembling Aspen – Black Spruce – Herb Poor

V 8

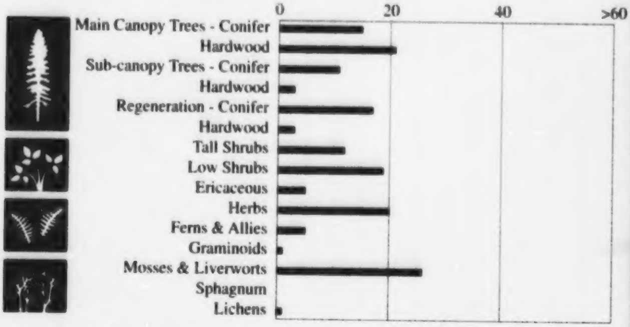
Description: Mixedwood stands dominated by trembling aspen and black spruce. Medium number of shrubs and herbs. Forest floor mainly deciduous and coniferous leaf litter and feathermosses. Occurs mainly on fresh to moist, sandy to silty soils (n = 112).

Overstorey: Trembling aspen^{7}, Black spruce^{7}, Jack pine^{5}, White birch^{4}, White spruce^{4}, Balsam fir^{4}.

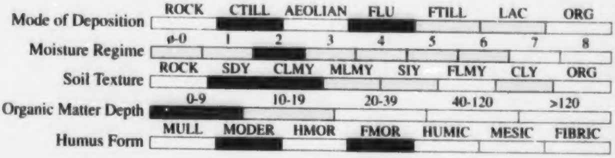
Shrubs: Balsam fir, Black spruce, Trembling aspen, White birch; Bunchberry, Twinflower, Early low blueberry, Bush honeysuckle, Velvetleaf blueberry, Serviceberries, Showy mountain ash, Beaked hazel, Dwarf raspberry, Mountain maple, Creeping snowberry.

Herbs: Wild lily-of-the-valley, Blue bead lily, Sarsaparilla, Starflower, Goldthread, Large-leaved aster, Violets, Ground pine, Wolf's claw clubmoss, Interrupted clubmoss.

Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Wavy-leaved moss, Curly heron's-bill moss, Stair-step moss.



Soil Types: S2^{2}, S1^{1}, S5^{1}, S3^{1}, S7^{1}, (others)^{4}.



Black Ash – Speckled Alder – Sedge

V 9

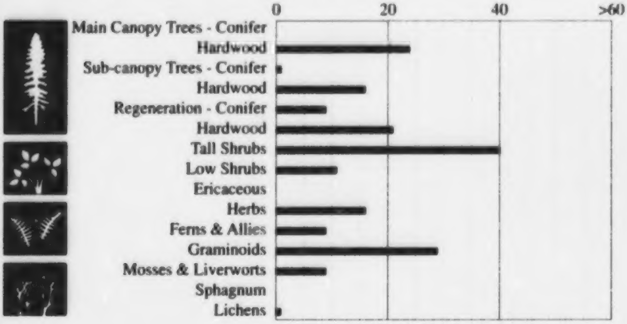
Description: Hardwood stands dominated by black ash. Medium number of shrubs, herb rich. Abundant tall shrubs, grasses and sedges, and ferns. Forest floor mainly deciduous leaf litter. Occurs on moist to wet soils of various textures (n = 5).

Overstorey: Black ash^{10}, Balsam poplar^{2}, White birch^{2}, Balsam fir^{2}, White elm^{2}.

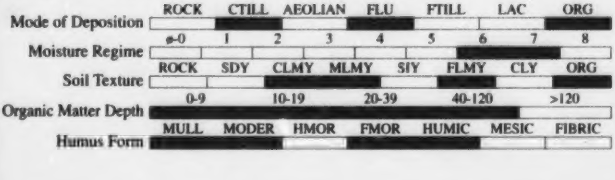
Shrubs: Black ash, Balsam fir, Balsam poplar, White spruce; Speckled alder, Mountain maple, Wild red raspberry, Dwarf raspberry, Red osier dogwood, Bristly wild rose, Bristly black currant, Bunchberry.

Herbs: Sedges, Drooping wood-reed grass, Violets, Spinulose shield fern, Wild lily-of-the-valley, Woodland horsetail, Fragrant bedstraw, Naked mitrewort, Starflower, Northern lady fern, Large-leaved aster, Wood sorrel, Sarsaparilla, *Pyrola* spp., Goldthread, Rough-stemmed goldenrod, Canada blue-joint, Sweet coltsfoot.

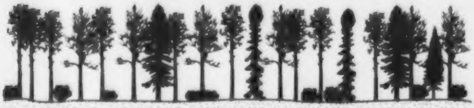
Mosses, Lichens and Liverworts: *Plagiothecium* spp., *Mnium* spp., Common fern moss, Schreber's moss, Common four-tooth moss, Northern tree moss, *Calliergon* spp., Sickle moss, Curly heron's-bill moss.



Soil Types: S14^{4}, S15^{4}, S19^{2}.



Trembling Aspen – Balsam Poplar – Speckled Alder



V 10

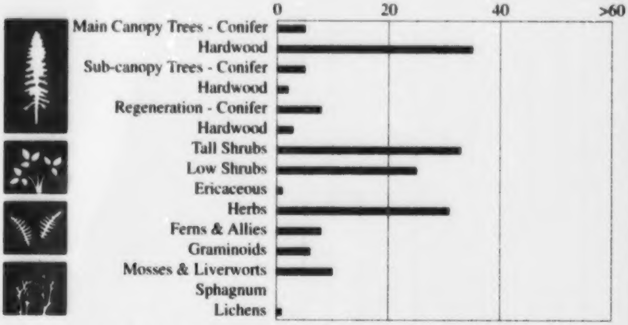
Description: Hardwood stands dominated by trembling aspen and balsam poplar; spruces and balsam fir common in the understorey. Medium number of shrubs, herb rich. Abundant tall and low shrubs. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh to moist, silty to clayey soils (n = 52).

Overstorey: Trembling aspen^{8}, Balsam poplar^{5}, Black spruce^{3}, White spruce^{2}, Balsam fir^{2}.

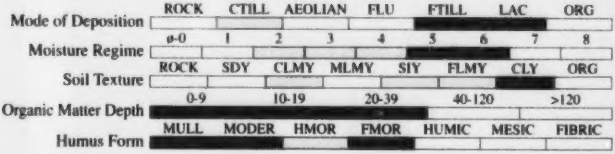
Shrubs: Black spruce, Balsam poplar, White spruce, Trembling aspen, Balsam fir; Speckled alder, Dwarf raspberry, Wild red raspberry, Bristly wild rose, Bunchberry, Bristly black currant, Red osier dogwood, Swamp red currant, Serviceberries, Skunk currant, Squashberry.

Herbs: Fragrant bedstraw, Naked mitrewort, Sedges, Sweet coltsfoot, Large-leaved aster, Wild lily-of-the-valley, Violets, Woodland horsetail, Canada bluejoint, Sarsaparilla, Spinulose shield fern, Wild strawberry, Starflower, Fireweed, Bluebells/Northern bluebells, Oak fern, Blue bead lily, Wood anemone.

Mosses, Lichens and Liverworts: Schreber's moss, Electrified cat-tail moss, Sickle moss.



Soil Types: S15^{3}, S14^{2}, S16^{2}, S13^{2}, (others)^{1}.



Trembling Aspen – Black Spruce – Bush Honeysuckle – Herb Rich

V 11

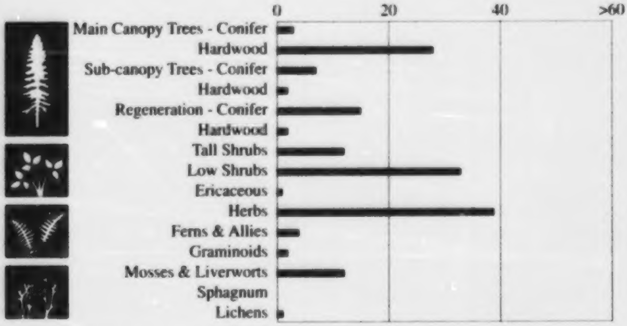
Description: Hardwood stands dominated by trembling aspen and black spruce; balsam fir abundant in secondary canopy and understorey. Medium number of shrubs, herb rich. Abundant low shrubs. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh to moist, medium loamy to clayey soils (n = 28).

Overstorey: Trembling aspen^{9}, Black spruce^{7}, Balsam fir^{4}, White spruce^{2}, Balsam poplar^{1}, Jack pine^{1}.

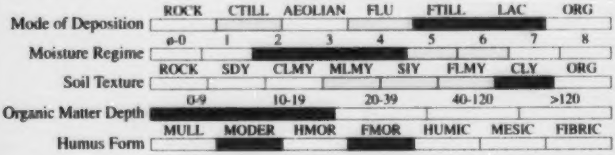
Shrubs: Balsam fir, Trembling aspen, Black spruce; Bunchberry, Dwarf raspberry, Twinflower, Bristly wild rose, Bush honeysuckle, Canada honeysuckle, Squashberry, Speckled alder, Showy mountain ash, Bristly black currant, Serviceberries, Red osier dogwood, Wild red raspberry.

Herbs: Violets, Sarsaparilla, Wild lily-of-the-valley, Naked mitrewort, Starflower, Large-leaved aster, Fragrant bedstraw, Blue bead lily, Rose twisted-stock, Sweet coltsfoot, Wood anemone, Wild strawberry, Goldthread, Oak fern, Sedges, Fireweed, Interrupted clubmoss, Broad-leaved reed grass, Spinulose shield fern.

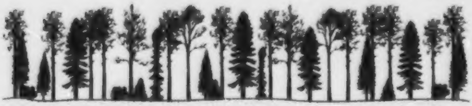
Mosses, Lichens and Liverworts: Schreber's moss, Electrified cat-tail moss, Plume moss, Stair-step moss.



Soil Types: S14^{4}, S13^{3}, S15^{1}, (others)^{2}.



Trembling Aspen – White Spruce – Squashberry



V 12

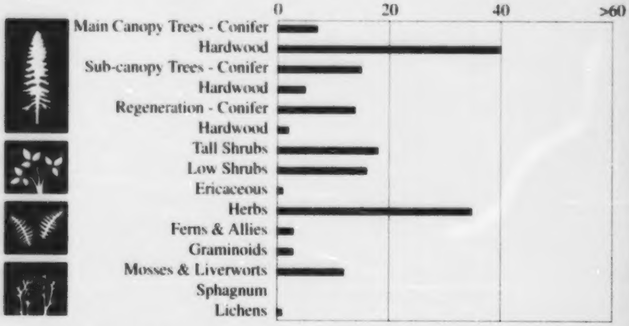
Description: Hardwood mixedwood stands dominated by trembling aspen and white spruce; balsam fir abundant in secondary canopy and understorey. Medium number of shrubs, herb rich. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh to moist soils of various textures (n = 40).

Overstorey: Trembling aspen^9, White spruce^7, Balsam fir^7, Black spruce^3, White birch^1, Balsam poplar^2.

Shrubs: Balsam fir, White spruce, Trembling aspen; Dwarf raspberry, Bunchberry, Bristly wild rose, Squashberry, Bush honeysuckle, Twinflower, Showy mountain ash, Beaked hazel, Mountain maple, Canada honeysuckle, Swamp red currant, Serviceberries, Wild red raspberry, Speckled alder, Red osier dogwood, Bristly black currant.

Herbs: Sarsaparilla, Violets, Naked mitrewort, Wild lily-of-the-valley, Fragrant bedstraw, Wood anemone, Blue bead lily, Large-leaved aster, Rose twisted-stock, Starflower, Sweet coltsfoot, Bluebells/Northern bluebells, Red baneberry, Sedges.

Mosses, Lichens and Liverworts: Schreber's moss, Electrified cat-tail moss, Plume moss, Stair-step moss, Curly heron's-bill moss, Stump pigtail moss.



Soil Types: S13^5, S14^2, S15^1, (others)^2.

Mode of Deposition	ROCK	CTILL	AEOLIAN	FLU	FTILL	LAC ■	ORG	
Moisture Regime	0-0	1	2 ■	3	4	5	6	7	8
Soil Texture	ROCK	SDY	CLMY	MLMY	SIY	FLMY	CLY ■	ORG
Organic Matter Depth	0-9 ■	10-19 ■	20-39	40-120	>120			
Humus Form	MULL	MODER ■	HMOR	FMOR ■	HUMIC	MESIC	FIBRIC	

Balsam Poplar – Trembling Aspen – Mountain Maple – Ferns

V 13

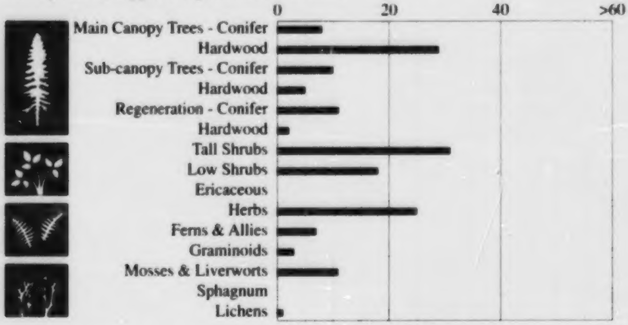
Description: Hardwood mixedwood stands dominated by balsam poplar and trembling aspen. Medium number of shrubs, herb rich. Abundant tall shrubs. Forest floor mainly deciduous leaf litter. Occurs mainly on fresh to moist, medium loamy to clayey soils (n = 42).

Overstorey: White birch^{6}, Trembling aspen^{6}, Balsam fir^{6}, White spruce^{5}, Balsam poplar^{5}.

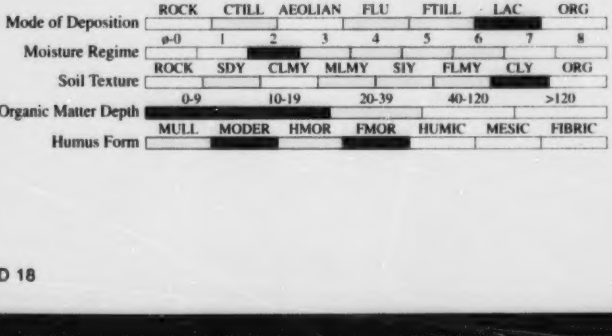
Shrubs: Balsam fir, White birch, White spruce, Trembling aspen; Dwarf raspberry, Mountain maple, Canada honeysuckle, Beaked hazel, Bunchberry, Showy mountain ash, Swamp red currant, Bristly black currant, Squashberry.

Herbs: Naked mitrewort, Sarsaparilla, Blue bead lily, Fragrant bedstraw, Starflower, Large-leaved aster, Violets, Rose twisted-stock, Wild lily-of-the-valley, Wood anemone, Sedges, Spinulose shield fern, Oak fern, Northern lady fern, Woodland horsetail, Goldthread, Interrupted clubmoss, Sweet coltsfoot.

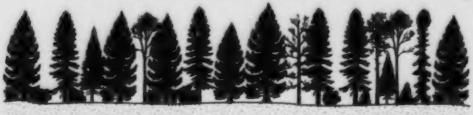
Mosses, Lichens, Liverworts: Schreber's moss, Electrified cat-tail moss, *Brachythecium* spp., Curly heron's-bill moss.



Soil Types: S13^{4}, S14^{2}, S15^{1}, S12^{1}, (others)^{2}.



White Cedar – White Spruce – Mountain Maple – Ferns



V 14

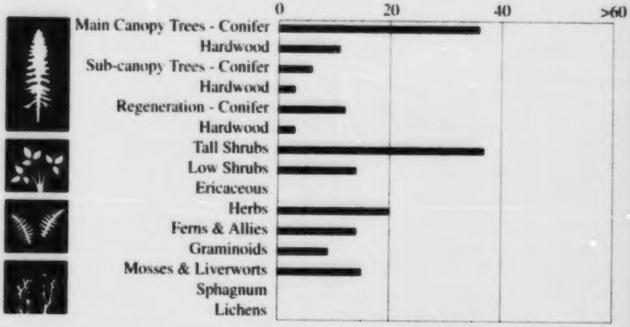
Description: Coniferous mixedwood stands dominated by white cedar and/or white spruce; common associates include balsam fir and white birch. Medium number of shrubs, herb rich. Abundant tall shrubs, ferns, grasses and sedges. Forest floor mainly coniferous and deciduous leaf litter with scattered patches of mosses. Occurs mainly on fresh to moist, silty to clayey soils (n = 10).

Overstorey: White cedar^{7}, White spruce^{5}, Balsam fir^{3}, White birch^{3}, Black ash^{2}, Black spruce^{1}, Trembling aspen^{1}.

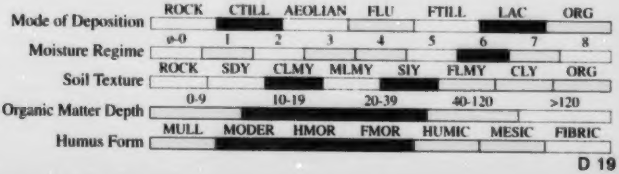
Shrubs: Balsam fir, White cedar, White birch, White spruce; Dwarf raspberry, Mountain maple, Canada honeysuckle, Showy mountain ash, Bunchberry, Bristly black currant, Swamp red currant, Wild red raspberry, Beaked hazel, Red osier dogwood, Twinflower, Speckled alder.

Herbs: Naked mitrewort, Violets, Fragrant bedstraw, Sarsaparilla, Sedges, Rose twisted-stock, Oak fern, Blue bead lily, Starflower, Goldthread, Wild lily-of-the-valley, Spinulose shield fern, Northern lady fern, Shining clubmoss, Wood anemone, Sweet coltsfoot, Smaller enchanter's nightshade, Broad-leaved reed grass, Rattlesnake fern, Nodding trillium, Large-leaved aster, Wood sorrel, Bluebells/Northern bluebells.

Mosses, Lichens and Liverworts: Schreber's moss, Stair-step moss, *Mnium* spp., Electrified cat-tail moss, Common fern moss, Plume moss, Curly heron's-bill moss, Sickle moss.

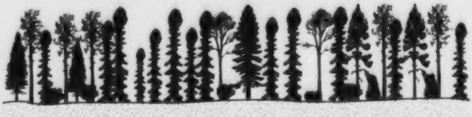


Soil Types: S16^{3}, S15^{2}, S7^{1}, S9^{1}, S11^{1}, S14^{1}, S19^{1}.



Black Spruce – Herb Rich

V 15



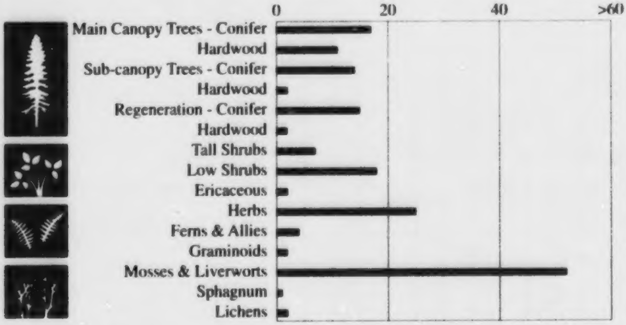
Description: Mixedwood stands dominated by black spruce. Associated tree species include balsam fir and trembling aspen. Medium number of shrubs, herb rich. Species in shrub layer variable; generally of low abundance. Forest floor mainly feathermoss with patches of deciduous and coniferous leaf litter. Occurs mainly on fresh to moist soils of various textures (n = 67).

Overstorey: Black spruce^{9}, Trembling aspen^{5}, Balsam fir^{5}, Balsam poplar^{3}, White spruce^{3}, White birch^{2}, Jack pine^{2}.

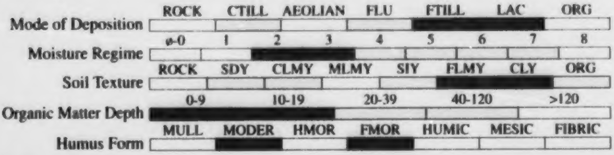
Shrubs: Balsam fir, Black spruce, Trembling aspen; Twinflower, Dwarf raspberry, Bunchberry, Bristly wild rose, Showy mountain ash, Creeping snowberry, Swamp red currant, Speckled alder, Velvetleaf blueberry, Bush honeysuckle, Serviceberries, Bristly black currant, Canada honeysuckle, Squashberry.

Herbs: Wild lily-of-the-valley, Naked mitrewort, Violets, Sarsaparilla, Large-leaved aster, Blue bead lily, Starflower, Sweet coltsfoot, Fragrant bedstraw, Goldthread, Wood anemone, Woodland horsetail, Sedges, Interrupted clubmoss, Oak fern, Rose twisted-stock, Dwarf rattlesnake plantain, Wild strawberry.

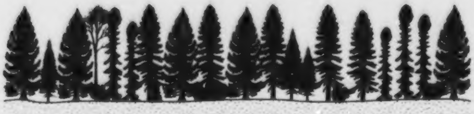
Mosses, Lichens and Liverworts: Schreber's moss, Stair-step moss, Plume moss, Wavy-leaved moss, Electrified cat-tail moss, Curly heron's-bill moss.



Soil Types: S13^{4}, S14^{2}, S12^{1}, S16^{1}, (others)^{2}.



White Cedar – Spruce – Balsam Fir – Ferns



V 16

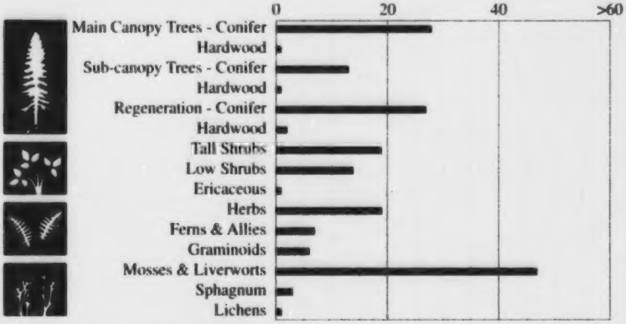
Description: Conifer stands dominated by white cedar, black and white spruce, and balsam fir. Medium number of shrubs, herb and moss rich. Abundant tall and low shrubs, ferns, sedges and horsetail. Forest floor mainly mosses with patches of deciduous and coniferous leaf litter. Occurs mainly on moist to wet soils of various textures (n = 41).

Overstorey: White cedar^{6}, White spruce^{6}, Black spruce^{6}, Balsam fir^{4}, White birch^{2}.

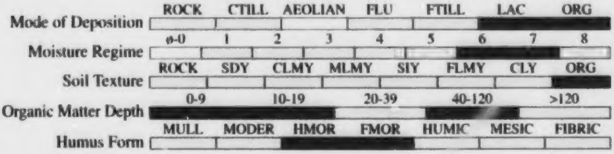
Shrubs: Balsam fir, White cedar, White birch, Black spruce; Dwarf raspberry, Bunchberry, Twinflower, Canada honeysuckle, Showy mountain ash, Creeping snowberry, Mountain maple, Speckled alder, Bristly black currant, Red osier dogwood, Swamp red currant, Bristly wild rose, Serviceberries.

Herbs: Starflower, Naked mitrewort, Wild lily-of-the-valley, Blue bead lily, Sedges, Violets, Goldthread, Fragrant bedstraw, Sarsaparilla, Oak fern, Rose twisted-stalk, Wood anemone, Sweet coltsfoot, Woodland horsetail, Spinulose shield fern, Meadow horsetail.

Mosses, Lichens and Liverworts: Schreber's moss, Stair-step moss, Electrified cat-tail moss, Plume moss, Curly heron's-bill moss, Common green peat moss, *Mnium* spp., Sickle moss, Wavy-leaved moss.



Soil Types: S13^{2}, S17^{2}, S15^{1}, S16^{1}, S18^{1}, (others)^{3}.



Jack Pine – Black Spruce – Feathermoss

V 17

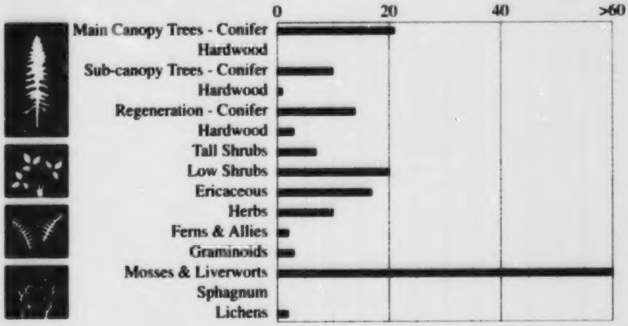
Description: Conifer stands dominated by jack pine. Black spruce is common in the secondary canopy and understorey. Medium number of shrubs, herb poor. Ericaceous shrubs common to sparse. Forest floor mainly feathermoss with scattered patches of coniferous litter. Occurs mainly on dry to moist soils of various textures (n = 35).

Overstorey: Jack pine^{9}, Black spruce^{6}, White birch^{1}, White spruce^{1}, Balsam fir^{1}.

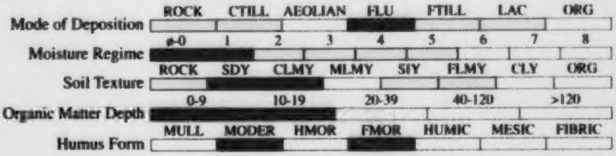
Shrubs: Black spruce, White birch, Balsam fir; Bunchberry, Early low blueberry, Bush honeysuckle, Twinflower, Velvetleaf blueberry, Creeping snowberry, Trailing arbutus, Serviceberries, Showy mountain ash, Green alder, Labrador-tea.

Herbs: Wild lily-of-the-valley, Blue bead lily, Starflower, Goldthread, Sarsaparilla, Spinulose shield fern.

Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Plume moss, Reindeer lichen, Curly heron's-bill moss.



Soil Types: S1^{3}, S5^{1}, S7^{1}, S3^{1}, SS3^{1}, (others)^{3}.



Jack Pine – Black Spruce – Blueberry

V 18

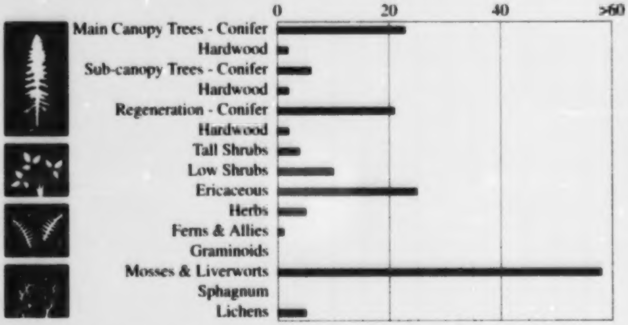
Description: Conifer stands dominated by jack pine, associated with black spruce, usually in the secondary canopy. Black spruce and balsam fir are common in the understorey. Blueberries are abundant. Medium number of shrubs, herb poor, lichens present. Forest floor mainly feathermoss with scattered patches of coniferous and deciduous litter. Occurs mainly on dry to fresh, sandy to coarse loamy soils (n = 37).

Overstorey: Jack pine^{8}, Black spruce^{6}, White birch^{3}, Trembling aspen^{1}, Red pine^{1}, White pine^{1}.

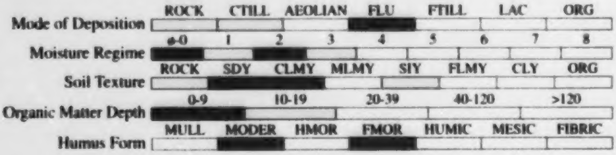
Shrubs: Balsam fir, Black spruce, White birch; Early low blueberry, Bunchberry, Velvetleaf blueberry, Twinflower, Bush honeysuckle, Trailing arbutus, Creeping snowberry, Serviceberries.

Herbs: Wild lily-of-the-valley, Blue bead lily.

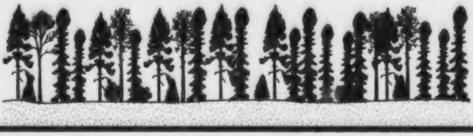
Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Reindeer lichen, Curly heron's-bill moss, False pixie cup lichen, Coral lichen, Powder horn lichen, Northern naugehyde liverwort, Naugehyde liverwort.



Soil Types: S1^{4}, S5^{2}, SS1^{1}, (others)^{3}.



Black Spruce – Stair-step Moss



V 19

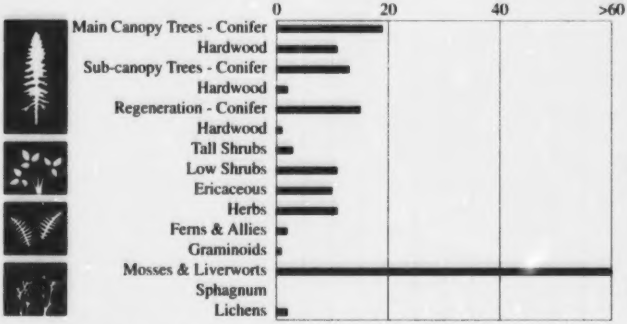
Description: Mixedwood stands dominated by black spruce. Associated species include jack pine and trembling aspen. Sparse black spruce and balsam fir in the understorey, along with sparse ericaceous and low, woody shrubs. Medium number of shrubs, herb poor. Forest floor mainly feathermoss with scattered patches of deciduous and coniferous litter. Occurs mainly on fresh to moist soils of various textures (n = 22).

Overstorey: Black spruce^{10}, Jack pine^{6}, Trembling aspen^{6}, White birch^{2}.

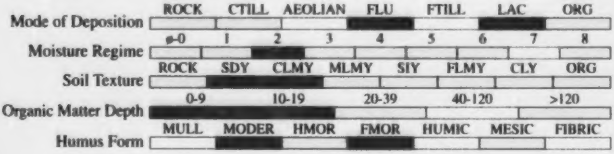
Shrubs: Black spruce, Balsam fir, Trembling aspen; Bunchberry, Twinflower, Creeping snowberry, Labrador-tea, Early low blueberry, Velvetleaf blueberry, Showy mountain ash, Serviceberries, Bush honeysuckle, Bristly wild rose, Dwarf raspberry.

Herbs: Wild lily-of-the-valley, Large-leaved aster, Starflower, Blue bead lily, Goldthread, Sweet coltsfoot.

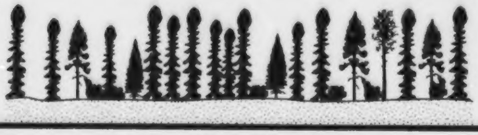
Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Plume moss, Stair-step moss, Curly heron's-bill moss, Electrified cat-tail moss, Reindeer lichen.



Soil Types: (S7, S10)^{3}, S1^{1}, S14^{1}, (others)^{5}.



Black Spruce – Jack Pine – Feathermoss



V 20

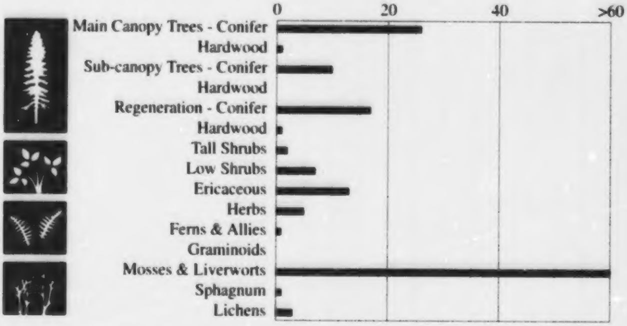
Description: Conifer stands dominated by black spruce, with sparse jack pine. Sparse black spruce and balsam fir in understorey. Ericaceous shrubs common. Shrub and herb poor. Forest floor mainly feathermoss with scattered patches of coniferous litter; lichens present. Occurs mainly on dry to moist, sandy to coarse loamy soils (n = 91).

Overstorey: Black spruce^{10}, Jack pine^{6}, Balsam fir^{2}, Trembling aspen^{1}.

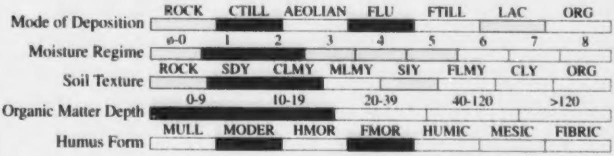
Shrubs: Black spruce, Balsam fir; Early low blueberry, Bunchberry, Labrador-tea, Velvetleaf blueberry, Creeping snowberry, Twinflower, Trailing arbutus, Serviceberries.

Herbs: Wild lily-of-the-valley, Blue bead lily.

Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Plume moss, Reindeer lichen, Curly heron's-bill moss, Stair-step moss.

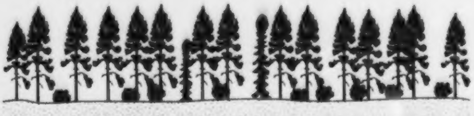


Soil Types: (S1, S3)^{3}, S2^{1}, S5^{1}, S7^{1}, (others)^{4}.



Jack Pine – Blueberry – Feathermoss – Lichen

V 21

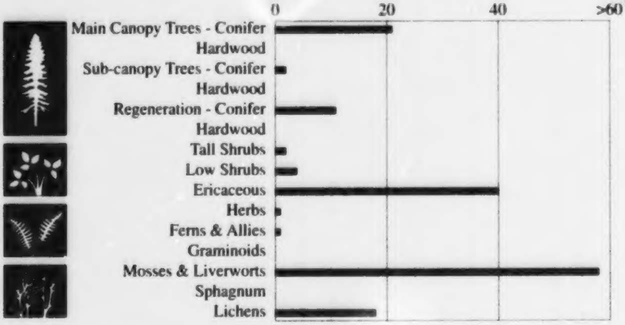


Description: Jack pine stands, with sparse black spruce in the understorey. Blueberries abundant. Shrub and herb poor. Forest floor mainly feathermoss with scattered patches of coniferous litter. Lichens abundant. Occurs mainly on dry to fresh, sandy to coarse loamy soils (n = 46).

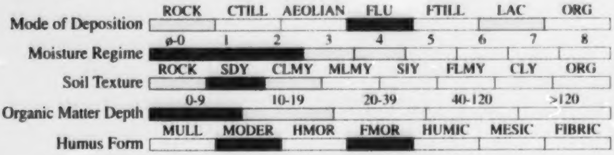
Overstorey: Jack pine^9, Black spruce^2.

Shrubs: Black spruce, Jack pine; Velvetleaf blueberry, Sheep laurel, Early low blueberry, Wintergreen, Twinflower, Creeping snowberry, Trailing arbutus.

Mosses, Lichens and Liverworts: Schreber's moss, Reindeer lichen, Wavy-leaved moss, Coral lichen, Yellow-green lichen, Plume moss.



Soil Types: S1^6, S3^1, SS2^1, (others)^2.



Black Spruce – Jack Pine – Feathermoss – Lichen

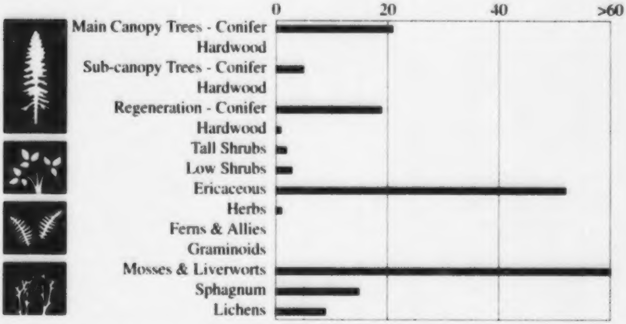
V 22

Description: Conifer stands dominated by black spruce, with sparse jack pine. Black spruce common in the understorey. Ericaceous shrubs abundant. Shrub and herb poor. Similar to V 20 but with more lichens. Forest floor mainly feathermoss with scattered patches of sphagnum and coniferous litter. Lichens common. Occurs mainly on dry to moist soils of various textures (n = 19).

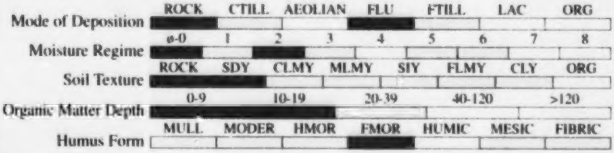
Overstorey: Black spruce^{10}, Jack pine^{6}.

Shrubs: Black spruce, Jack pine; Sheep laurel, Early low blueberry, Velvetleaf blueberry, Labrador-tea, Creeping snowberry.

Mosses, Lichens and Liverworts: Schreber's moss, Wavy-leaved moss, Reindeer lichen, Lady's tresses peat moss, Coral lichen, Northern naugehyde liverwort, Powder horn lichen, False pixie cup lichen, Plume moss, Common green peat moss.

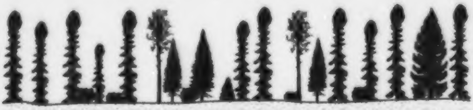


Soil Types: SS3^{2}, S1^{2}, S3^{1}, S5^{1}, S13^{1}, (others)^{3}.



Black Spruce – Labrador-tea – Speckled Alder – Stair-step Moss

V 23



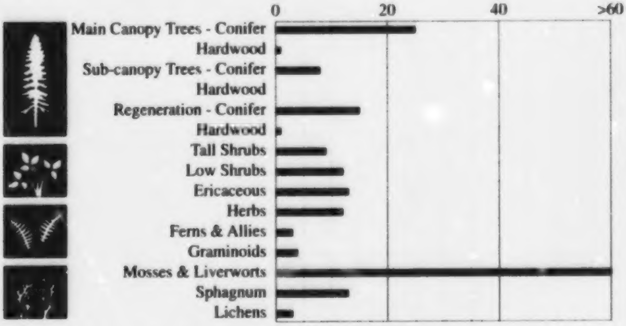
Description: Black spruce stands, with sparse black spruce and balsam fir in the understorey. Labrador-tea abundant, speckled alder common. Horsetails common. Medium number of ericaceous shrubs, semi-shrubs and herbs. Forest floor mainly feathermoss with scattered patches of sphagnum. Occurs mainly on moist, loamy to clayey, and wet organic soils (n = 57).

Overstorey: Black spruce^{10}, Balsam fir^{3}, Trembling aspen^{2}, White cedar^{1}.

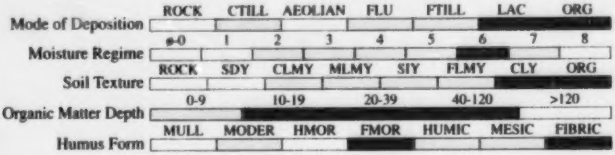
Shrubs: Black spruce, Balsam fir; Bunchberry, Creeping snowberry, Twinflower, Labrador-tea, Dwarf raspberry, Bristly wild rose, Velvetleaf blueberry, Early low blueberry, Speckled alder, Showy mountain ash, Serviceberries.

Herbs: Wild lily-of-the-valley, Sedges, Goldthread, Naked mitrewort, Sweet coltsfoot, Violets, Wood anemone, Blue bead lily, Woodland horsetail, Starflower, Canada blue-joint, Fragrant bedstraw.

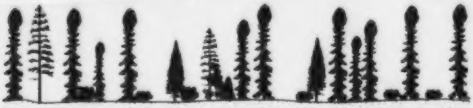
Mosses, Lichens and Liverworts: Schreber's moss, Plume moss, Stair-step moss, Wavy-leaved moss, Lady's tresses peat moss, Common green peat moss, Reindeer lichen, Curly heron's-bill moss.



Soil Types: S16^{2}, S17^{2}, S13^{2}, S12^{1}, S14^{1}, S19^{1}, (others)^{1}.



Black Spruce – Speckled Alder – Labrador-tea – Sphagnum



V 24

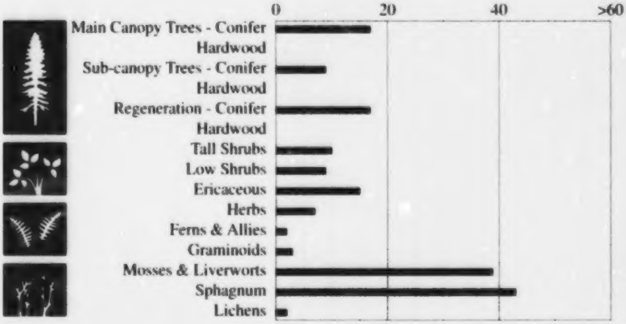
Description: Black spruce stands with sparse black spruce and balsam fir in the understorey. Speckled alder abundant. Labrador-tea and horsetails common. Medium number of ericaceous shrubs and semi-shrubs, herb poor. Forest floor mainly sphagnum and feathermoss. Occurs mainly on wet organic soils (n = 95).

Overstorey: Black spruce^{10}, Larch^{3}, Balsam fir^{2}.

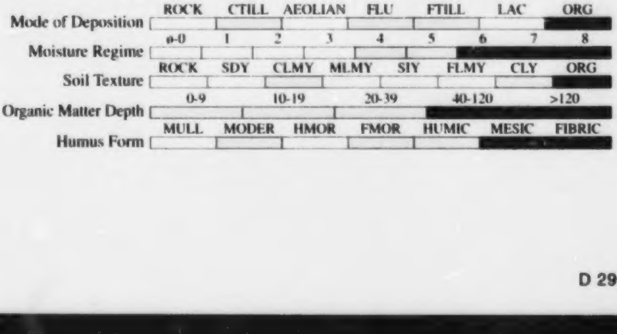
Shrubs: Black spruce, Balsam fir; Creeping snowberry, Labrador-tea, Bunchberry, Twinflower, Speckled alder, Early low blueberry, Velvetleaf blueberry, Dwarf raspberry, Sheep laurel.

Herbs: Goldthread, Sedges, Wild lily-of-the-valley, Woodland horsetail, Three-leaved smilacina, Blue bead lily, Naked mitrewort.

Mosses, Lichens and Liverworts: Schreber's moss, Common green peat moss, Lady's tresses peat moss, Wavy-leaved moss, Plume moss, Reindeer lichen, Stair-step moss, Red fat-leaved peat moss, False pixie cup lichen, Powder horn lichen.



Soil Types: S17^{4}, S18^{2}, (others)^{4}.



Black Spruce – Larch – Speckled Alder – Stair-step Moss

V 25

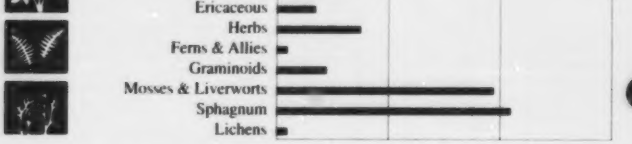
Description: Black spruce stands with larch. Black spruce common in the understorey. Speckled alder abundant. Shrub rich with a medium number of herbs. Grasses and sedges abundant. Forest floor mainly sphagnum and feathermoss, with scattered patches of coniferous litter and small water-filled pools. Occurs mainly on wet organic soils (n = 56).

Overstorey: Black spruce^{10}. Larch^{6}. White cedar^{1}.

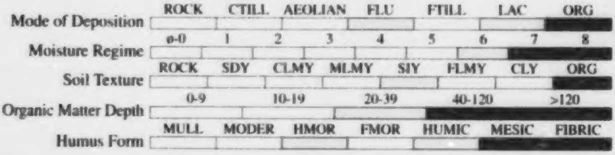
Shrubs: Black spruce. Balsam fir: Labrador-tea. Creeping snowberry. Bunchberry. Speckled alder. Dwarf raspberry. Twinflower. Northern honeysuckle. Red osier dogwood. Alder-leaved buckthorn. Velvetleaf blueberry. Small cranberry. Serviceberries. Red currant.

Herbs: Sedges. Naked mitrewort. Goldthread. Three-leaved smilacina. Violets. Starflower. Fragrant bedstraw. Wood anemone. Wild strawberry. Wild lily-of-the-valley. Sarsaparilla. Sweet coltsfoot.

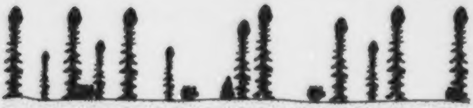
Mosses, Lichens and Liverworts: Schreber's moss. Stair-step moss. Common green peat moss. Plume moss. Lady's tresses peat moss. *Mnium* spp.. Electrified cat-tail moss. Reindeer lichen. Wavy-leaved moss. Red fat-leaved peat moss.



Soil Types: S17^{5}, S18^{3}, (S19, S16)^{2}.



Black Spruce – Leatherleaf – Sphagnum



V 26

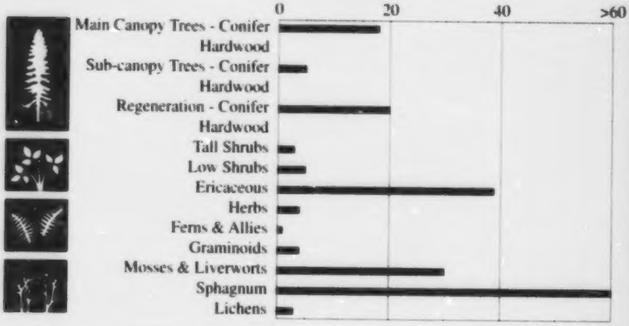
Description: Black spruce stands, with abundant black spruce in the understorey. Labrador-tea and leatherleaf abundant. Shrub and herb poor. Forest floor mainly sphagnum, with scattered patches of feathermoss. Occurs mainly on wet organic soils, sometimes on moist soils of various textures (n = 64).

Overstorey: Black spruce^{10}.

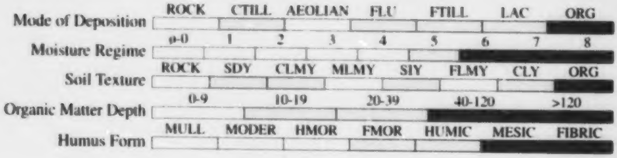
Shrubs: Black spruce; Labrador-tea, Creeping snowberry, Early low blueberry, Leatherleaf, Small cranberry, Velvetleaf blueberry, Pale laurel, Bunchberry, Sheep laurel.

Herbs: Sedges, Three-leaved smilacina, Goldthread.

Mosses, Lichens and Liverworts: Schreber's moss, Common green peat moss, Lady's tresses peat moss, Reindeer lichen, Red fat-leaved peat moss, Wavy-leaved moss, Brown bog peat moss, Northern naugehyde liverwort, Plume moss, Powder horn lichen, False pixie cup, Yellow two-leaved peat moss.

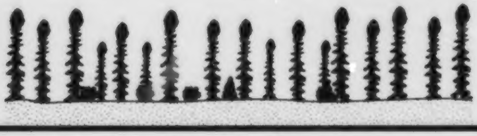


Soil Types: S17^{5}, S18^{2}, S16^{2}, S19^{1}.



Black Spruce – Labrador-tea – Feathermoss – Sphagnum

V 27



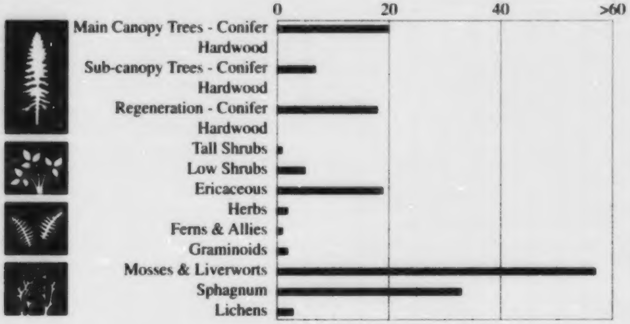
Description: Black spruce stands, with abundant black spruce in the understorey. Labrador-tea abundant. Shrub and herb poor. Forest floor mainly feathermoss with patches of sphagnum. Occurs mainly on moist soils of various textures and on wet organic soils (n = 41).

Overstorey: Black spruce^{10}.

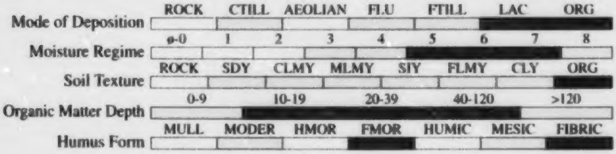
Shrubs: Black spruce, Balsam fir; Labrador-tea, Creeping snowberry, Velvetleaf blueberry, Early low blueberry, Bunchberry, Sheep laurel, Small cranberry.

Herbs: Woodland horsetail, Three-leaved smilacina, Sedges.

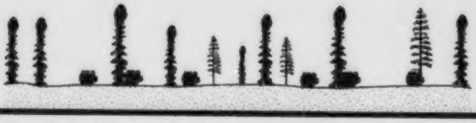
Mosses, Lichens and Liverworts: Schreber's moss, Lady's tresses peat moss, Wavy-leaved moss, Common green peat moss, Reindeer lichen, Plume moss, Stair-step moss, Northern naugehyde liverwort, Red fat-leaved peat moss.



Soil Types: S17^{3}, S16^{2}, S14^{1}, S18^{1}, (others)^{3}.



Black Spruce – Bog Rosemary – Pale Laurel – Sphagnum



V 28

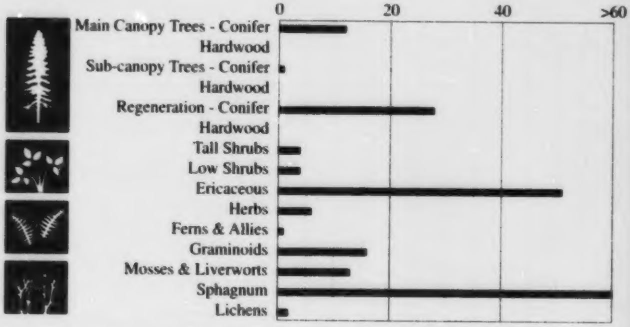
Description: Stunted black spruce or occasionally larch stands; black spruce abundant, larch common in the understorey. Abundant ericaceous shrubs, including leatherleaf, Labrador-tea, bog rosemary and laurels. Medium number of ericaceous shrubs, herb poor. Sedges common. Forest floor mainly sphagnum, with small, water-filled pools. Occurs on wet organic soils (n = 20).

Overstorey: Black spruce^7, Larch^1.

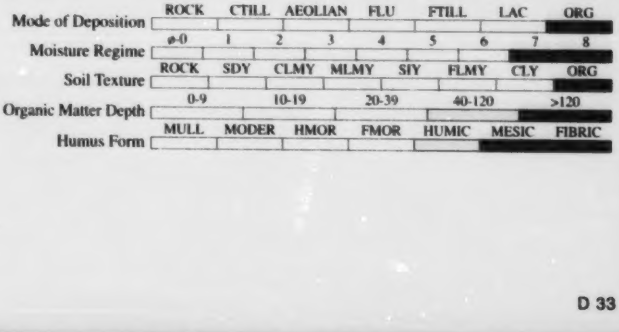
Shrubs: Black spruce, Larch; Small cranberry, Leatherleaf, Labrador-tea, Pale laurel, Bog rosemary, Creeping snowberry, Early low blueberry.

Herbs: Sedges, Three-leaved smilacina, Goldthread.

Mosses, Lichens and Liverworts: Brown bog peat moss, Schreber's moss, Red fat-leaved peat moss, Yellow two-leaved peat moss, Common green peat moss, Reindeer lichen, Lady's tresses peat moss.



Soil Types: S17^7, S18^3.



Species Percentage Cover by Vegetation Type

Cover values are given for species occurring on more than two-thirds of sample plots in a vegetation type. Species in brackets are those occurring on more than one-third but less than two-thirds of plots. * Tree species occurred in less than one-third of the plots.

Codes: 1 = 1% 2 = 2 to 5% 3 = 6 to 10% 4 = 11 to 20% 5 = 21 to 40% 6 = > 40%

V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Trees:																												
Abies balsamea				(3)	(4)	(3)	(3)	(4)			(3)	(4)	(4)		(4)	(4)												
Acer rubrum		(4)*		(4)*		(2)*	(3)*	(2)*																				
Acer saccharum spp. *saccharum*			6																									
Betula alleghaniensis	(5)*	(5)*	(5)*	(3)*																								
Betula papyrifera	4	5		(4)	(3)	4	4	(3)					(3)															
Fraxinus nigra									5																			
Larix laricina																									(4)			
Picea glauca	4	(4)		(3)	(4)	(3)	(4)	(4)				4	(4)	(4)		(4)												
Picea mariana						(3)	4	4			4				5	(4)	(4)	(4)	5	5		4	5	5	5	5	5	4
Pinus banksiana						(4)	(4)	(4)									5	5	(3)	(4)	5	(4)						
Pinus resinosa	(3)*	(3)*		(5)*		(5)	(5)*	(5)*									(5)*	(5)*										
Pinus strobus	(3)*	(5)		(5)*		(4)	(5)*	(4)*					(5)*				(2)*	(5)*		(4)*	(3)*							
Populus balsamifera spp. *balsamifera*										(5)			(5)															
Populus tremuloides			5	5	5	4	(4)	5		5	5	5	(5)		(4)				(4)									
Thuja occidentalis	(4)													5		(5)												
Tree Shrubs:																												
Abies balsamea	4	4	3	3	2	4	4	4	3	(2)	4	4	3	2	3	4	2	3	3	2	(2)		3	3	(2)	(2)	2	
Acer rubrum		(2)					(2)																					

V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tree Shrubs:																												
Acer saccharum ssp. *saccharum*			6																									
Betula alleghaniensis			(2)																									
Betula papyrifera	(3)	(2)		(2)	(2)	(3)	3	(2)					(2)	2	(2)	(2)	2	(2)										
Fraxinus nigra									4																			
Larix laricina																												(2)
Picea glauca	(2)	2	2	(2)		(3)	(3)	(2)	(2)	(2)		(2)	(2)	(2)														
Picea mariana						(3)	3	3		(3)	2	(2)			3	(2)	3	4	3	4	3	4	3	3	4	4	4	5
Pinus banksiana																					(2)	(2)						
Populus balsamifera ssp. *balsamifera*									(2)	(2)																		
Populus tremuloides			2	(2)	2	(2)		(1)		(2)	2	(2)	(2)		(2)				(1)									
Thuja occidentalis	3													3		4												
Shrubs:																												
Acer spicatum	3	5	4	5	5	(3)	3	(3)	3			(4)	5	4		4												
Alnus incana ssp. *rugosa*									5	5	(3)	(3)		(5)	(3)	3							3	4	4	(3)		
Alnus viridis ssp. *crispa*																	(3)											
Amelanchier spp.		(1)			2	(2)	(2)	(2)		(2)	(2)	(1)			(1)	(1)	(1)	(1)	(1)	(1)	(2)	(1)	(1)	(2)	(1)			
Andromeda polifolia ssp. *glaucophylla*																												2

...Species Percentage Cover by Vegetation Type

Shrubs: V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Chamaedaphne calyculata																									(2)	3		5
Cornus canadensis	(2)	2		2	2	2	3	3	(1)	(2)	2	2	2	2	2	2	3	2	2	2			2	2	2	(2)	2	
Cornus stolonifera									2	(2)	(2)	(2)		(2)	(2)	(2)									(2)			
Corylus cornuta ssp. *cornuta*	(3)	(3)	5	4	4	4	(2)	(2)				(3)	2	(3)														
Diervilla lonicera		2	2	2	3	2	2	3			4	2			(2)		2	2	(2)									
Epigaea repens																	(2)	(2)		(2)	(2)							
Gaultheria hispidula							1	(1)							(2)	1	(2)	(2)	2	2	(2)	2	2	2	2	2	2	2
Gaultheria procumbens																					(2)							
Kalmia angustifolia																		(4)			(5)	4		(2)		(4)	(2)	
Kalmia polifolia																										(2)	(1)	2
Ledum groenlandicum							2										(2)		3	3		4	4	3	2	5	4	5
Linnaea borealis ssp. *longiflora*	(1)	(2)		(1)		2		2			2	2		(1)	2	2	2	2	2	(2)	(2)		1	1	1			
Lonicera canadensis	(1)	2		(2)	2						(2)	(1)	2	2	(2)	2												
Lonicera hirsuta												(1)																
Lonicera villosa																									1			
Oxycoccus microcarpus																								(1)	(1)	1	(1)	1
Prunus virginiana ssp. *virginiana*			(1)																									

...Species Percentage Cover by Vegetation Type

V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Shrubs:																												
Rhamnus alnifolia																									(2)			
Ribes glandulosum										(2)																		
Ribes lacustre									(2)	(2)	(2)	(1)	2	1	(2)	(1)									(1)			
Ribes triste										(2)	(2)	(1)	2	(2)	(1)	(1)									(1)			
Rosa acicularis ssp. *sayi*					(2)			(2)	(2)	2	2	1			2	(1)			(2)				2					
Rubus idaeus ssp. *melanolasius*									2	3	(2)	(2)		(2)	(2)										(2)			
Rubus pubescens				(2)	2			(2)	3	3	3	2	2	2	2	2			(2)				2	(2)	2			
Salix bebbiana																	(2)											
Sorbus decora	1	(1)		(2)			2	(2)			(1)	(1)	2	2	2	2	(2)		1				(1)	(1)				
Taxus canadensis	(4)																											
Vaccinium angustifolium		(2)		(2)		2	2	2							(1)		2	3	2	2	4	3	2	2	(1)	2	2	(2)
Vaccinium myrtilloides				(2)		2	2	2							(1)		2	4	2	2	3	3	2	2	(1)	(2)	2	(2)
Viburnum edule										(2)	(2)	2	(2)		(1)	(1)												
Herbs:																												
Actaea rubra												(1)	(1)															
Anemone quinquefolia var. *quinquefolia*					(1)					(1)	(1)	1	1	(1)	(1)	1			(1)				(1)		(1)			
Aralia nudicaulis	2	2	2	2	3	2	(2)	2	(2)	(3)	3	3	2	2	2	2	(2)								(2)			

...Species Percentage Cover by Vegetation Type

Herbs: V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aster ciliolatus										(2)					(1)													
Aster macrophyllus	(2)	2	3	3	5	2	(2)	(3)	(1)	4	4	4	3	(2)	3				(2)									
Circaea alpina														(2)														
Clintonia borealis	2	2	2	3	2	2	3	2		(2)	2	2	2	2	2	2	2	(2)	(2)	(2)			(2)	(2)				
Coptus trifolia	(2)	(2)		(2)			2	(2)	(1)		(1)		(1)	1	(2)	2	(2)		(2)	(1)			1	2	2	(2)		(1)
Epilobium angustifolium										(2)	(1)												(1)					
Fragaria virginiana ssp. *virginiana*										(2)	(2)	(1)			(1)				(1)				(1)		(2)			
Galium triflorum			(1)		(1)				2	1	1	1	1	1	1	1							(1)		(1)			
Goodyera repens															(1)													
Maianthemum canadense	2	2	(1)	2	2	2	2	2	2	1	2	1	1	1	2	1	2	2	2	2	(1)		1	(1)	(1)			
Maianthemum trifolium																							(1)	(2)	2	2	(2)	2
Mertensia paniculata										(2)	(1)	(1)	(1)	(1)	(1)	(2)												
Mitella nuda					(2)				(2)	2	2	2	2	2	2	2							1	(1)	2			
Oxalis acetosella ssp. *montana*	(2)								(1)					(2)														
Petasites frigidus var. *palmatus*									(1)	2	2	2	(1)	(2)	2	(1)			(1)				1		(1)			
Pyrola spp.									(2)																			
Solidago rugosa spp. *rugosa*									(1)																			

V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Herbs:																												
Streptopus roseus		(1)	1	(1)	2			(1)			1	1	1	1	(1)	1												
Trientalis borealis	1	1	1	1	(1)	(1)	1	1	(1)	(1)	1	1	1	1	1	1	1		(1)				(1)		1			
Trillium cernuum														(1)														
Viola spp.	(1)	(2)		(2)	2			(1)	2	2	2	2	2	2	1	2							1		1			
Graminoids, Ferns & Allies:																												
Athyrium filix-femina ssp. *angustum*									(2)				(2)	(2)		(2)												
Botrychium virginianum										(1)				(1)														
Calamagrostis canadensis									(3)	(2)		(2)											(2)		(2)			
Carex spp.	(2)	(1)	(1)	(1)	(2)				4	2	(2)	(2)	2	3	(2)	3							2	2	3	2	(2)	4
Cinna latifolia									4		(1)			(2)		(1)									(2)			
Dryopteris carthusiana	2	2	1	(2)					2	(2)	(1)		(2)	2		(1)	(1)											
Equisetum arvense										(1)						(2)												
Equisetum sylvaticum									1	(2)			(2)		(1)	(2)							(2)	(2)	(1)	(2)	(1)	
Gymnocarpium dryopteris										(2)	(1)	(2)	(1)	2	(2)	2												
Huperzia lucidula		(2)	1											(1)														
Lycopodium annotinum		(2)					(1)	(2)			(2)		(2)		(2)	(2)												
Lycopodium clavatum						(2)		(1)																				

...Species Percentage Cover by Vegetation Type

V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Graminoids, Ferns & Allies:																												
Lycopodium obscurum	(2)	2	3	2	1	(1)	(2)	(1)																				
Oryzopsis asperifolia																			(2)									
Pteridium aquilinum var. *latiusculum*		(2)	(1)	3	(3)	4	(2)											(2)										
Mosses & Liverworts:																												
Brachythecium spp.		(2)	1		(2)	(1)	(2)	(2)				(2)	(2)			(3)												
Climacium dendroides									(2)																			
Dicranum flagellare	(2)																											
Dicranum fuscescens var. *fuscescens*	(1)	(2)	1	(1)		1	2	(1)	(1)			(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)			(1)	(1)	(1)		(1)	
Dicranum polysetum	(1)	(1)				1	2	1							1	(1)	2	2	2	2	2	2	2	2	(1)	2	2	
Dicranum scoparium	(2)																											
Drepanocladus uncinatus				(1)	(1)				(1)	(1)	(1)			(2)		(2)									(2)			
Hylocomium splendens								(2)			(1)	(1)		2	2	4			3	(2)			4	2	4		2	
Mnium cuspidatum									(1)	(1)																		
Mnium pseudopunctatum														(1)		(2)									1			
Pleurozium schreberi	(2)	2		2	(1)	2	3	4	(2)	(2)	2	2	2	1	5	4	6	6	6	6	6	6	6	5	4	5	6	3
Polytrichum commune var. *commune*								(2)																				
Ptilidium spp.																		(1)	(1)	(2)		(1)				(2)	(2)	

V:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Mosses & Liverworts:																												
Ptilium crista-castrensis				(2)			(1)	2		(2)	(2)	(1)		(1)	3	2	3		3	3	(2)	(2)	3	2	2	(2)	3	(1)
Rhytidiadelphus triquetrus										(2)	3	2	(3)	(2)	3	4			(2)						2			
Sphagnum angustifolium																									(3)	(3)		6
Sphagnum capillifolium																(2)						(4)	3	3	3	4	4	(3)
Sphagnum fuscum																									(2)	(3)		4
Sphagnum girgensohnii																(2)						(4)	(3)	5	5	5	4	(4)
Sphagnum magellanicum																								4	(4)	4	(3)	3
Sphagnum wulfianum																								(2)			(2)	
Tetraphis pellucida	(1)								(1)																			
Thuidium delicatulum									(2)					(1)		(2)												
Lichens:																												
Cladina mitis																					(2)							
Cladina rangiferina						(1)	(1)										1	2	(1)	2	3	2	(1)	1	(1)	2	2	(1)
Cladina stellaris var. *stellaris*																		(2)			3	(2)						
Cladonia chlorophaea	(1)																(1)	(1)			(1)	(1)		(1)		(1)	(1)	
Cladonia coniocraea	(1)	(1)									(1)				(1)			(1)				(1)		(1)		(1)	(1)	

Introduction to Soil Types

This section contains a list of names and short descriptions for each of the 23 NE-FEC soil types, soil profile diagrams for each soil type, percentage of soil type by vegetation type table and a percentage of soil type by boreal ecosite table. The defining features of the soil types remain the same as in the previous version of the FEC, but the descriptions are more robust due to the larger sample size.

The soil type names highlight diagnostic features including depth to bedrock, moisture regime, calcareousness and texture. The soil type descriptions list ranges for each of the above soil features, and for drainage, forest humus form, organic matter depth, mode of deposition and sample size (i.e. n = x). Use the descriptions as a quick reference for comparing the characteristic features of different soil types.

The soil profile diagrams are cross-sectional diagrams, showing the typical sequence of horizons and their range in thickness for each soil type. Note that the scale used for the forest floor is larger than that used for the mineral soil. Refer to page A 10 for an explanation of the patterns used to illustrate the mineral and organic soil horizons, mottles and gley, bedrock, and coarse fragments.

The soil type by ecosite and soil type by vegetation type tables (pages E 7 and E 8) are interpretive tools. Use these tables when interpreting maps and inventories of NE-FEC ecosites, to determine the relationships between soil types, vegetation types and ecosites across a landscape.

Very Shallow	SS 1	Discontinuous Organic Mat on Bedrock
	SS 2	Extremely Shallow Soil on Bedrock
	SS 3	Very Shallow Soil on Bedrock
	SS 4	Very Shallow Soil on Boulder Pavement
Sandy	S 1	Dry to Fresh Non-calcareous Sandy
	S 2	Dry to Fresh Calcareous Sandy
	S 3	Fresh to Moist Non-calcareous Sandy
	S 4	Fresh to Moist Calcareous Sandy
Coarse Loamy	S 5	Dry to Fresh Non-calcareous Coarse Loamy
	S 6	Dry to Fresh Calcareous Coarse Loamy
	S 7	Fresh to Moist Non-calcareous Coarse Loamy
	S 8	Fresh to Moist Calcareous Coarse Loamy
Medium Loamy – Silty	S 9	Fresh Non-calcareous Medium Loamy to Silty
	S 10	Fresh Calcareous Medium Loamy to Silty
	S 11	Fresh to Moist Non-calcareous Medium Loamy to Silty
	S 12	Fresh to Moist Calcareous Medium Loamy to Silty

...Introduction to Soil Types

Fine Loamy – Clayey	S 13	Fresh Fine Loamy to Clayey
	S 14	Moist Fine Loamy to Clayey
Shallow Organic	S 15	Moist Black H/Hi/Ah
	S 16	Moist Peaty Phase
Deep Organic	S 17	Fibric Organic
	S 18	Mesic Organic
	S 19	Humic Organic

Soil Type Names and Descriptions

SS 1	**Discontinuous Organic Mat on Bedrock:** discontinuous moss and lichen cover, with no soil matrix. Occurs on bedrock outcrops. Dry (Ø to 0), very rapidly drained sites, typically with much exposed bedrock. Occurs on bedrock knobs, ridges or plateaus (n = 10).
SS 2	**Extremely Shallow Soil on Bedrock:** organic material, either alone or with a minimal soil matrix, overlying bedrock. Bedrock is encountered within 5 cm of any mineral soil surface. Dry to moderately fresh soils (Ø to 1), very rapidly to rapidly drained. Occurs on bedrock knobs, ridges or plateaus (n = 7).
SS 3	**Very Shallow Soil on Bedrock:** very shallow soils overlying bedrock. Bedrock is encountered within 30 cm of any mineral soil surface. Dry to very moist soils (Ø to 6), very rapidly to imperfectly drained. Moist, imperfectly drained soils occur in depressions in the bedrock which hold runoff. Occurs on bedrock knobs, ridges or plateaus (n = 36).
SS 4	**Very Shallow Soil on Boulder Pavement:** varying proportions of organic matter and mineral soil overlying boulder pavement. Boulders are encountered within 30 cm of any mineral soil surface. Dry to very moist soils (Ø to 6), very rapidly to imperfectly drained. This type often occurs on telluric lower slope positions, associated with nutrient-enriched seepage flow. Occurs on bouldery till plains or colluvial materials on talus slopes (n = 6).
S 1	**Dry to Fresh Non-calcareous Sandy:** moderately dry to fresh (0 to 2), very rapidly to moderately well drained sandy soils (textures are vcS, cS, mS, fS, LvcS, LcS, LmS, LfS). Occasionally dry (Ø) and very rapidly drained, when the soil material is gravel. Free carbonates absent. Forest humus forms are fibrimors and raw moders. The organic matter depth ranges from 0 to 15 cm. Occurs mainly on glaciofluvial materials, occasionally on coarse-textured moraine or aeolian materials (sand dunes) (n = 117).
S 2	**Dry to Fresh Calcareous Sandy:** moderately dry to fresh (0 to 2), very rapidly to moderately well-drained sandy soils (textures are vcS, cS, ms, fS, LvcS, LcS, LmS, Lfs). Occasionally dry (Ø) and very rapidly drained, when the soil material is gravel. Free carbonates are present within 100 cm of the mineral soil surface. Forest humus forms are fibrimors and raw moders. The organic matter depth ranges from 0 to 19 cm. Occurs mainly on glaciofluvial or sandy lacustrine materials, occasionally on coarse-textured moraine (n = 40).

S 3 **Fresh to Moist Non-calcareous Sandy:** very fresh to very moist (3 to 6), moderately well to poorly drained sandy soils (textures are vcS, cS, mS, fS, LvcS, LcS, LmS, LfS). Free carbonates are absent. Forest humus forms are mainly fibrimors, with occasional raw moders and fibric peaty mors. The organic matter depth ranges from 0 to 19 cm. Occurs mainly on glaciofluvial materials, occasionally on coarse-textured moraine (n = 49).

S 4 **Fresh to Moist Calcareous Sandy:** very fresh to very moist (3 to 6), moderately well to poorly drained sandy soils (textures are vcS, cS, mS, fS, LvcS, LcS, LmS, LfS). Free carbonates are present within 100 cm of the mineral soil surface. Forest humus forms are mainly fibrimors, with occasional raw moders and fibric peaty mors. The organic matter depth ranges from 0 to 19 cm. Occurs on glaciofluvial or sandy lacustrine materials (n = 12).

S 5 **Dry to Fresh Non-calcareous Coarse Loamy:** moderately dry to fresh (0 to 2), rapidly to moderately well drained, shallow to deep, coarse loamy soils (textures are vfS, LvfS, SivcS, SicS, SimS, SifS, SivfS). Free carbonates are absent. Forest humus forms are fibrimors and raw moders. The organic matter depth ranges from 0 to 15 cm. Occurs mainly on glaciofluvial materials, occasionally on coarse-textured moraine or aeolian materials (sand dunes) (n = 75).

S 6 **Dry to Fresh Calcareous Coarse Loamy:** moderately dry to fresh (0 to 2), rapidly to moderately well drained, shallow to deep, coarse loamy soils (textures are vfS, LvfS, SivcS, SicS, SimS, SifS, SivfS). Free carbonates are present within 100 cm of the mineral soil surface. Forest humus forms are fibrimors and raw moders. The organic matter depth ranges from 0 to 15 cm. Occurs mainly on glaciofluvial or sandy lacustrine materials, occasionally on coarse-textured moraine (n = 16).

S 7 **Fresh to Moist Non-calcareous Coarse Loamy:** very fresh to very moist (3 to 6), moderately well to poorly drained coarse loamy soils (textures are vfS, LvfS, SivcS, SicS, SimS, SifS, SivfS). Free carbonates are absent. Forest humus forms are mainly fibrimors and moders, with occasional fibric peaty mors. The organic matter depth ranges from 5 to 19 cm. Occurs on glaciofluvial materials and coarse-textured moraine (n = 57).

S 8 **Fresh to Moist Calcareous Coarse Loamy:** very fresh to very moist (3 to 6), moderately well to poorly drained, coarse loamy soils (textures are vfS, LvfS, SivcS, SicS, SimS, SifS, SivfS). Free carbonates are present within 100 cm of the mineral soil surface. Forest humus forms are moders, humimors, and fibrimors with occasional peaty mors. The organic matter depth ranges from 5 to 19 cm. Occurs on sandy lacustrine and glaciofluvial materials (n = 21).

S 9 **Fresh Non-calcareous Medium Loamy to Silty:** moderately fresh to fresh (1 to 2), rapidly to moderately well drained, shallow to deep, medium loamy to silty soils (textures are SL, L, SiL, Si). Free carbonates are absent. Forest humus forms are fibrimors and raw moders. The organic matter depth ranges from 0 to 19 cm. Occurs on silty morainal, glaciofluvial or lacustrine materials (n = 39).

S 10 **Fresh Calcareous Medium Loamy to Silty:** moderately fresh to fresh (1 to 2), rapidly to moderately well drained, shallow to deep, medium loamy to silty soils (textures are SL, L, SiL, Si). Free carbonates are present within 100 cm of the mineral soil surface. Forest humus forms are moders and fibrimors, with occasional mulls. The organic matter depth ranges from 0 to 19 cm. Occurs on silty morainal, lacustrine or glaciofluvial materials (n = 22).

S 11 **Fresh to Moist Non-calcareous Medium Loamy to Silty:** very fresh to very moist (3 to 6), moderately well to poorly drained, shallow to deep, medium loamy to silty soils (textures are SL, L, SiL, Si). Free carbonates are absent. Forest humus forms are mainly fibrimors and raw moders, with occasional humimors and peaty mors. The organic matter depth ranges form 0 to 15 cm. Occurs on silty morainal, glaciofluvial or lacustrine materials (n = 40).

S 12 **Fresh to Moist Calcareous Medium Loamy to Silty:** very fresh to very moist (3 to 6), moderately well to poorly drained, shallow to deep, medium loamy to silty soils (textures are SL, L, SiL, Si). Free carbonates are present within 100 cm of the mineral soil surface. Forest humus forms are mainly fibrimors and raw moders, with occasional humimors and peaty mors. The organic matter depth ranges from 0 to 19 cm. Occurs on silty morainal, lacustrine or glaciofluvial materials (n = 33).

S 13 **Fresh Fine Loamy to Clayey:** fresh to very fresh (2 to 3), moderately well drained, moderately deep to deep, fine loamy to clayey soils (textures are SCL, SiCL, CL, SC, SiC, C). Free carbonates are usually present within 100 cm of the mineral soil surface. Forest humus forms are mainly fibrimors and moders, with occasional humimors. The organic matter depth ranges from 0 to 19 cm. Occurs on fine-textured lacustrine or clay till materials (n = 137).

S 14 **Moist Fine Loamy to Clayey:** moderately moist to very moist (4 to 6), moderately well to poorly drained, moderately deep to deep, fine loamy to clayey soils (textures are SCL, SiCL, CL, SC, SiC, C). Free carbonates are usually present within 100 cm of the mineral soil surface. Forest humus forms are mainly fibrimors and moders with occasional humimors and peaty mors. The organic matter depth ranges from 0 to 19 cm. Occurs on fine-textured lacustrine or clay till materials (n = 81).

S 15 **Moist Black H/Hi/Ah:** moderately moist to very moist (4 to 6), moderately well to poorly drained, shallow to deep soils, occurring on a variety of soil textures. Free carbonates are usually present within 100 cm of the mineral soil surface. Forest humus forms are moders and mulls. Humus forms are characterized by the presence of thick (5 cm), black or dark brown, H, or Hi, and Ah horizons consisting of mixed organic and mineral materials. The organic matter depth ranges from 5 to 35 cm. Occurs on a variety of materials, mainly fine-textured lacustrine or clay till soils (n = 61).

S 16 **Moist Peaty Phase:** moderately moist to very moist (4 to 6), imperfectly to poorly drained, shallow to deep soils, occurring on a variety of soil textures. The organic matter depth ranges from 20 to 39 cm. Forest humus forms are peaty mors, fibrimors and humimors. Occurs on a wide variety of lacustrine, morainal and glaciofluvial materials (n = 76).

S 17 **Fibric Organic:** very moist to wet (6 to 8), very poorly drained organic soils, with the upper 40 cm dominated by fibric materials (Of; fibric peaty mors), with thick (average 81 cm) surface fibric horizon (Of) (n = 139).

S 18 **Mesic Organic:** very moist to wet (6 to 8), very poorly drained organic soils, with the upper 40 cm dominated by mesic materials (Om; mesic peaty mors), with thin (average 18 cm) surface fibric horizon (Of) (n = 60).

S 19 **Humic Organic:** very moist to wet (6 to 8), very poorly drained organic soils, with the upper 40 cm dominated by humic materials (Oh; humic peaty mors), with thin (average 14 cm) surface fibric horizon (Of) (n = 34).

Percentage of Soil Type by Ecosites

ES: Soil Type:	1p	1r	2	3	4	5f	5m	6f	6m	6c	7f	7m	7c	8	9p	9r	10	11	12	13p	13r	14	15	16	17	18	19	20	21
SS 1	80	20																											
SS 2	78																									11	11		
SS 3	51	26																					2	2		7	5	2	5
SS 4	57	14																								14	14		
S 1			23	19	29					4			6				1						1			9	7	1	
S 2			10	5	24					44			15														2		
S 3			14	14	35					10			6	8		4	4							2				2	2
S 4			8		25					25			17	17			8												
S 5			3	21	26					8			19										3	7		2	9		1
S 6			6		38					25			31																
S 7			2	27	20					3			14	5	2	2	8						3	2	2	2	6	3	3
S 8				10	10					19			10	19	5	5	24												
S 9							19		5			48											7		12		2	2	5
S 10							18		32			50																	
S 11							9		7			22		2	7	4	17						7	11	2		2	11	
S 12							21		24			18		3	12	6	15												
S 13						17		39			41			1	1		1									1			
S 14						12		30			10			9	4	6	30												
S 15				2	2	2	2	15	3		6	2	3	10	8	13	31						2					2	
S 16			1			1	3	4	3		1			31	26	8	22												
S 17																		23	43	22	4	9							
S 18																		22	43	23	5	7							
S 19																		12	32	32	21	3							

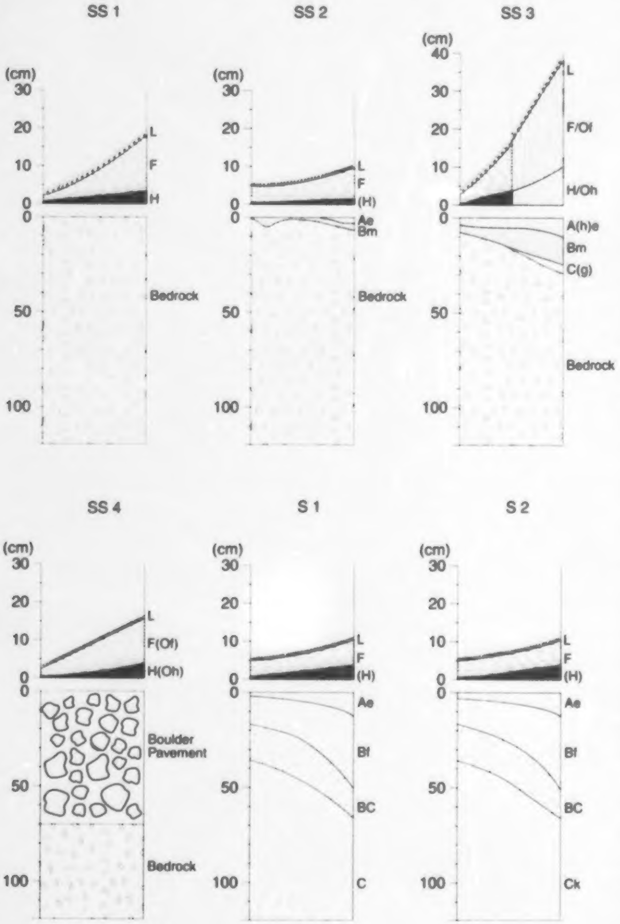
→ Read in this direction for percent totals (may not always equal 100 due to rounding).

Percentage of Soil Type by Vegetation Type

Soil Type: V Type:	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12	S 13	S 14	S 15	S 16	S 17	S 18	S 19	SS 1	SS 2	SS 3	SS 4
V 1	11		5		16		16		21		16									11		5	
V 2	4		9		26		9		17		13		4									17	
V 3							14		57		29												
V 4	11		7		30		7	2	11	2	12		11	2	5							2	
V 5	3	9		3	3	6	9	3	9	9	3	9	29	3	3								
V 6	37	5	5		21		11		11													11	
V 7	31		7		10		14		3		17		3							3		10	
V 8	14	15	9	2	13	2	9	5	6	4	4	3	6	4	3								1
V 9														40	40				20				
V 10	2					2		2		2	2	2	19	23	25	21							
V 11		4			4					4	4	7	36	29	14								
V 12		5				3		3		8	3		50	15	10	3						3	
V 13	2						2			7	7	10	38	17	12	5							
V 14							10		10		10			10	20	30			10				
V 15	1	1		1		1	1	1				10	39	24	4	9	3		1				
V 16	2			2		2	2	2			2	7	15	2	12	10	15	7	12	2			2
V 17	26	6	9		14		11	3	3		6		3	6							6	9	
V 18	41	5	8		16	3	5		3											11		5	3
V 19	9	5		5	5	5	14	5	5	14	5	5	5	9	5			5				5	
V 20	14	10	14	3	10	5	9	5	3	3	2	1	7		1					1	1	8	1
V 21	59	2	13	2	4	2	2									2				2	7	4	
V 22	16		11	5	11		5						11	5		5					5	21	5
V 23								2				9	16	9	9	19	18	7	9			4	
V 24			1		1		4				1		2	6	6	8	44	18	6			1	
V 25												2				13	45	25	16				
V 26	2						2						3	2	2	17	45	19	8			2	
V 27	2		2	2				2	2			5	2	10	5	24	29	7				2	2
V 28																	65	30	5				

→ Read in this direction for percent totals (may not always equal 100 due to rounding).

Typical Soil Profiles for Soil Types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(cm)
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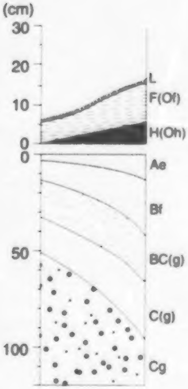
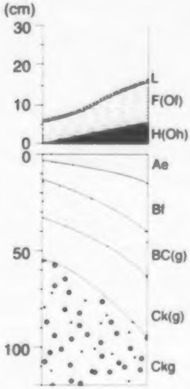
20
10
0
0
50
100
L
F
H
Bedrock
SS 2
(cm)
30
20
10
0
0
50
100
L
F
(H)
Ae
Bm
Bedrock
SS 3
(cm)
40
30
20
10
0
0
50
100
L
F/Of
H/Oh
A(h)e
Bm
C(g)
Bedrock
SS 4
(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
Boulder Pavement
Bedrock
S 1
(cm)
30
20
10
0
0
50
100
L
F
(H)
Ae
Bf
BC
C
S 2
(cm)
30
20
10
0
0
50
100
L
F
(H)
Ae
Bf
BC
Ck

...Typical Soil Profiles for Soil Types

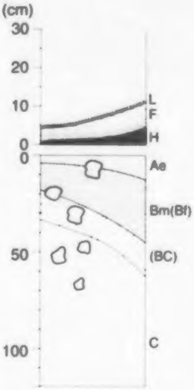
S 3


(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
Ae
Bf
BC(g)
C(g)
Cg

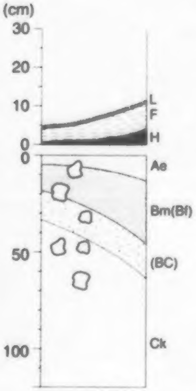
S 4


(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
Ae
Bf
BC(g)
Ck(g)
Ckg

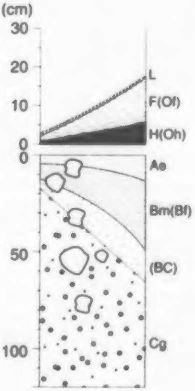
S 5


(cm)
30
20
10
0
0
50
100
L
F
H
Ae
Bm(Bf)
(BC)
C

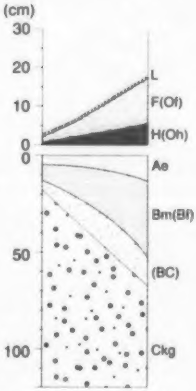
S 6


(cm)
30
20
10
0
0
50
100
L
F
H
Ae
Bm(Bf)
(BC)
Ck

S 7

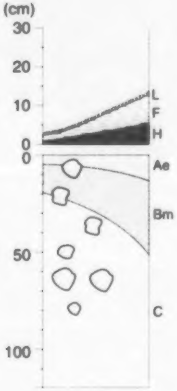

(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
Ae
Bm(Bf)
(BC)
Cg

S 8

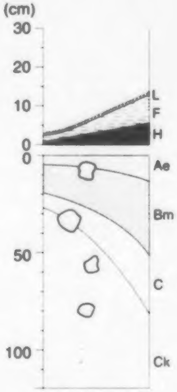

(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
Ae
Bm(Bf)
(BC)
Ckg

...Typical Soil Profiles for Soil Types

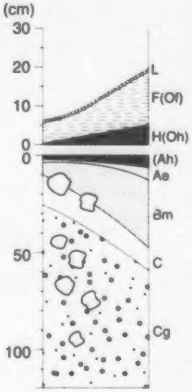
S 9


(cm)
30
20
10
0
0
50
100
L
F
H
Ae
Bm
C

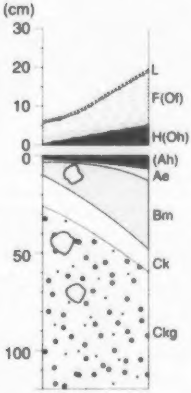
S 10


(cm)
30
20
10
0
0
50
100
L
F
H
Ae
Bm
C
Ck

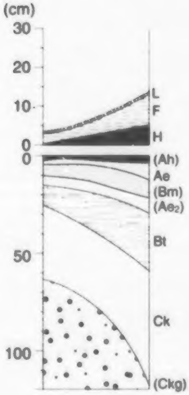
S 11


(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
(Ah)
Ae
Bm
C
Cg

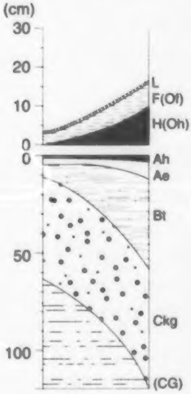
S 12


(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
(Ah)
Ae
Bm
Ck
Ckg

S 13

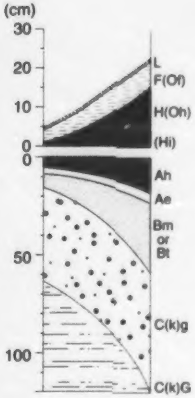

(cm)
30
20
10
0
0
50
100
L
F
H
(Ah)
Ae
(Bm)
(Ae2)
Bt
Ck
(Ckg)

S 14

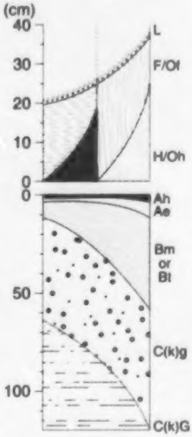

(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
Ah
Ae
Bt
Ckg
(CG)

...Typical Soil Profiles for Soil Types

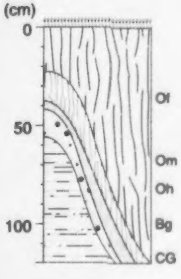
S 15


(cm)
30
20
10
0
0
50
100
L
F(Of)
H(Oh)
(Hi)
Ah
Ae
Bm
or
Bt
C(k)g
C(k)G

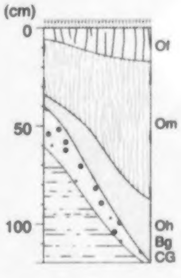
S 16


(cm)
40
30
20
10
0
0
50
100
L
F/Of
H/Oh
Ah
Ae
Bm
or
Bt
C(k)g
C(k)G

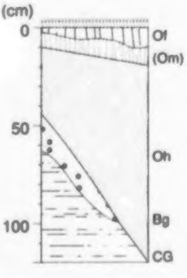
S 17


(cm)
0
50
100
Of
Om
Oh
Bg
CG

S 18


(cm)
0
50
100
Of
Om
Oh
Bg
CG

S 19


(cm)
0
50
100
Of
(Om)
Oh
Bg
CG

Introduction to Soil Descriptions

This section contains the keys, charts and diagrams used to recognize and describe landforms, position on slope, mineral and organic soil horizons, forest humus forms, soil texture classes, degree of decomposition of organic horizons, and soil moisture regime. The terminology used to describe soil characteristics of the NE-FEC soil and site types is explained.

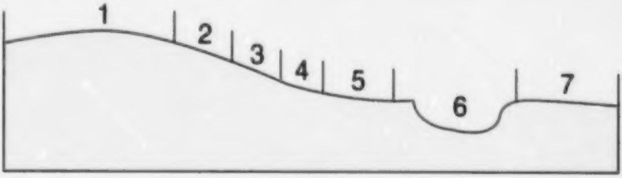
This information provides a consistent approach to the description of soil characteristics. Use this section to develop soil type modifiers as described on page A 5.

The material in this section is excerpted from the "Field Manual for Describing Soils in Ontario" (Ontario Centre for Soil Resource Evaluation 1993).

Parent Material and Landform

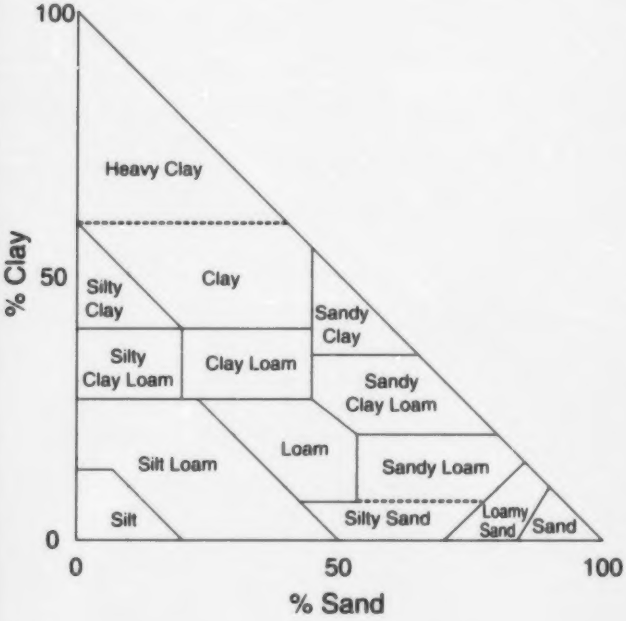
Parent Material	Mode of Deposition	Recognizable Features	Landforms
M Morainal (glacial)	By melting ice (drumlins during ice advance)	Heterogeneous mixture of boulders, sand, silt and clay; angular to rounded; non-sorted; non-stratified	Till plains; recessional moraines; drumlins
F Fluvial and glaciofluvial	By and in running water (e.g. river deposits)	Coarse textured; well-rounded; sorted and often stratified. Crossbedding, cuts and fill	Alluvial fans; flood plains; outwash plains; spillways; interlobate moraines; kames; eskers
L Lacustrine and glaciolacustrine	By running water into standing water (e.g. lake deposits)	Fine to medium textured; well-rounded; sorted and often varved with occasional ice-rafted pebbles. Sand and gravelly beach deposits	Deltas; lacustrine clay plains; beaches
W Marine	In or by sea water	Fine to coarse textured; well-rounded; moderately well sorted; often stratified. Presence of abundant shells	Marine plains
E Eolian	By wind	Coarse silt to medium sand; very well-rounded; very sorted; poorly compacted. Crossbedding	Dunes; loess blankets and veneers
O Organic	In cool, wet depressions	Black, organic remains in various stages of decomposition	Bogs; swamps; fens; marshes
C Colluvial	By direct, gravity-induced movement	Dependent on the nature of the material from which it was derived. Colluvium derived from bedrock typically contains angular coarse fragments	Talus cones, rubbly colluvial blanket
B Bedrock			Rock knobs; knolls; plains and ridges

Site Position on Slope



1.	**Crest**	The upper most portion of a slope, shape usually convex in all directions with no distinct aspect.
2.	**Upper Slope**	The upper portion of the slope immediately below the crest, slope shape usually convex with a specific aspect.
3.	**Middle Slope**	The area of the slope between the upper slope and the lower slope, where the slope is usually straight with a specific aspect.
4.	**Lower Slope**	The lower portion of the slope immediately above the toe, slope shape usually concave with a specific aspect.
5.	**Toe**	The lower most portion of the slope immediately below and adjacent to the lower slope, slope shape concave grading rapidly to level with no distinct aspect.
6.	**Depression**	Any area that is concave in all directions, usually at the toe of a slope or within level topography.
7.	**Level**	Any level area excluding toe slopes, generally horizontal with no distinct aspect.

Textural Triangle


100
% Clay
50
0
Heavy Clay
Clay
Silty Clay
Sandy Clay
Silty Clay Loam
Clay Loam
Sandy Clay Loam
Silt Loam
Loam
Sandy Loam
Silt
Silty Sand
Loamy Sand
Sand
0
50
100
% Sand

Notes:

1. The sand portion of the sand, loamy sand, sandy loam and silty sand texture classes are described more specifically based on the dominant sand size class. For example: very coarse sand, loamy very fine sand and fine sandy loam. See enclosed texture card and sand size classes described on page A 8.

2. The texture classes may be modified by adding suitable adjectives when coarse fragments occupy > 20 percent of the soil volume. For volumes 20 to 50 percent, use coarse fragment class name (boulder, stone, cobble, gravel) plus texture (e.g. gravelly sandy loam). For volumes > 50 percent, use additional adjective very (e.g. very stony clay loam).

Texture Field Tests

Feel Tests

Graininess Test: soil is rubbed between thumb and fingers to assess the percentage of sand. Sand feels grainy.

Dry Feel Test: for soils with > 50 percent sand. Soil is rubbed in the palm of the hand to dry it and to separate and estimate the size of the individual sand particles. The sand particles are then allowed to fall out of the hand and the amount of finer material (silt and clay) remaining is noted.

Stickiness Test: soil is wetted and compressed between the thumb and forefinger. Degree of stickiness is determined by noting how strongly it adheres to the thumb and forefinger upon release of pressure and how much it stretches.

Moist Cast Test: compress some moist soil by clenching it in your hand. If the soil holds together (i.e. forms a cast), then test the strength of the cast by tossing it from hand to hand. The more durable it is, the more clay is present.

Ribbon Test: moist soil is rolled into a cigarette shape and then squeezed out between the thumb and forefinger to form the longest and thinnest ribbon possible. Soils with a high silt content will form flakes or peel-like thumb imprints rather than a ribbon.

Taste Test: a small amount of soil is worked between the front teeth. Sand is distinguished as individual grains which grit sharply against the teeth. Silt particles are identified as a general fine grittiness, but individual grains cannot be identified. Clay particles have no grittiness.

Shine Test: a small amount of moderately dry soil is rolled into a ball and rubbed once or twice against a hard, smooth object such as a knife blade or a thumb nail. A shine on the ball indicates clay in the soil.

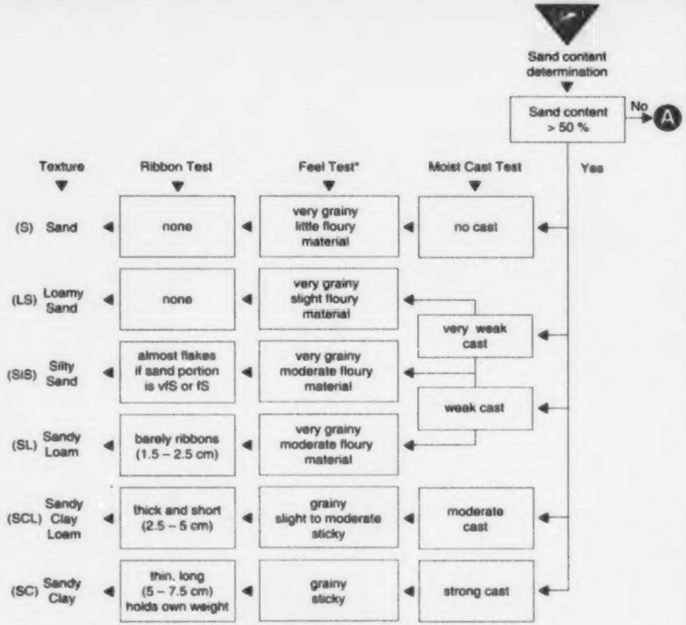
Field Test Characteristics of Texture Class

Texture Class	Feel Test	Moist Cast Test
Sand	grainy with little floury material	no cast
Loamy Sand	grainy with slight amount of floury material	very weak cast no handling
Silty Sand	grainy with moderate amount of floury material	weak cast, no handling
Sandy Loam	grainy with moderate amount of floury material	weak cast, allows careful handling
Loam	fairly soft and smooth with evident graininess	good cast, readily handled
Silt Loam	floury with slight graininess	weak cast, allows careful handling
Silt	very floury	weak cast, allows careful handling
Sandy Clay Loam	very substantial graininess	moderate cast
Clay Loam	moderate graininess	strong cast
Silty Clay Loam	smooth and floury	strong cast
Sandy Clay	substantial graininess	strong cast
Silty Clay	smooth	very strong cast
Clay	smooth	very strong cast

...Field Test Characteristics of Texture Class

Ribbon Test	Taste Test	Shine Test
none	unnecessary	unnecessary
none	unnecessary	unnecessary
almost flakes if sand portion is vfS or fS	unnecessary	unnecessary
barely ribbons (1.5 – 2.5 cm)	unnecessary	unnecessary
thick and very short (< 2.5 cm)	unnecessary	unnecessary
flakes, rather than ribbons	silt grittiness, some sand graininess	unnecessary
flakes, rather than ribbons	silt grittiness	unnecessary
short and thick (2.5 – 5 cm)	sand graininess clearly evident	slightly shiny
fairly thin, breaks readily, barely supports own weight	sand graininess clearly evident	slightly shiny
fairly thin, breaks readily, barely supports own weight	silt grittiness	slightly shiny
thin, fairly long (5 – 7.5 cm) holds own weight	sand graininess clearly evident	moderately shiny
thin, fairly long (5 – 7.5 cm) holds own weight	silt grittiness	moderately shiny
very thin, very long (> 7.5 cm)	smooth	very shiny

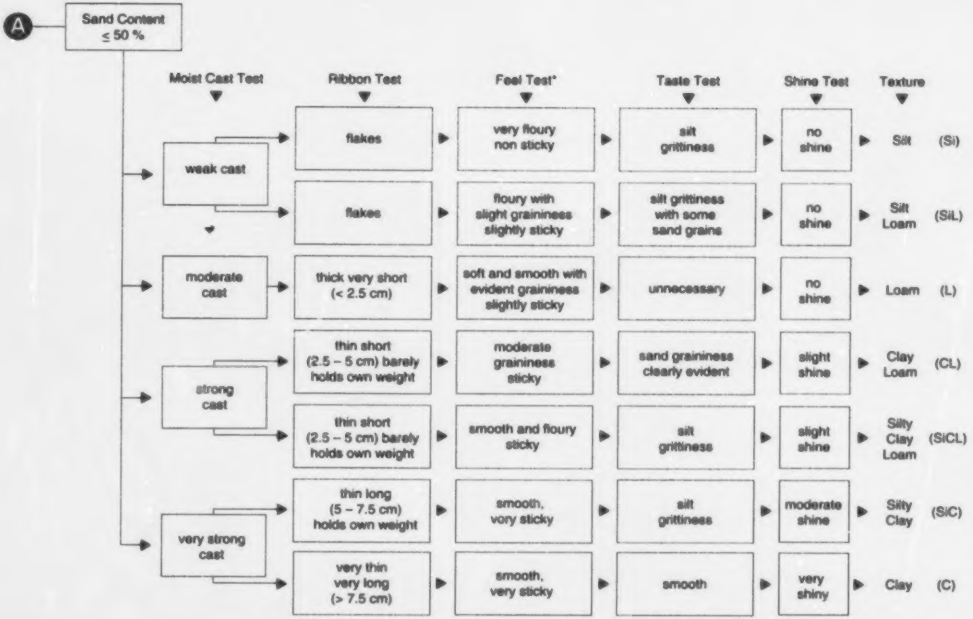
Finger Assessment of Soil Texture


Sand content determination
Sand content > 50 %
No
A
Yes
Moist Cast Test
Feel Test*
Ribbon Test
Texture
no cast
very weak cast
weak cast
moderate cast
strong cast
very grainy little floury material
very grainy slight floury material
very grainy moderate floury material
very grainy moderate floury material
grainy slight to moderate sticky
grainy sticky
none
none
almost flakes if sand portion is vfS or fS
barely ribbons (1.5 – 2.5 cm)
thick and short (2.5 – 5 cm)
thin, long (5 – 7.5 cm) holds own weight
(S) Sand
(LS) Loamy Sand
(SiS) Silty Sand
(SL) Sandy Loam
(SCL) Sandy Clay Loam
(SC) Sandy Clay

*Guide to Floury Material Description

little	10 % by volume
slight	10 – 30 % by volume
moderate	30 – 50 % by volume
very	> 50 % by volume

...Finger Assessment of Soil Texture



Moist Cast Test	Ribbon Test	Feel Test*	Taste Test	Shine Test	Texture	
weak cast	flakes	very floury non sticky	silt grittiness	no shine	Silt	(Si)
	flakes	floury with slight graininess slightly sticky	silt grittiness with some sand grains	no shine	Silt Loam	(SiL)
moderate cast	thick very short (< 2.5 cm)	soft and smooth with evident graininess slightly sticky	unnecessary	no shine	Loam	(L)
strong cast	thin short (2.5 – 5 cm) barely holds own weight	moderate graininess sticky	sand graininess clearly evident	slight shine	Clay Loam	(CL)
	thin short (2.5 – 5 cm) barely holds own weight	smooth and floury sticky	silt grittiness	slight shine	Silty Clay Loam	(SiCL)
very strong cast	thin long (5 – 7.5 cm) holds own weight	smooth, vory sticky	silt grittiness	moderate shine	Silty Clay	(SiC)
	very thin very long (> 7.5 cm)	smooth, very sticky	smooth	very shiny	Clay	(C)

Mottle Description and Photograph

Peter Uhlig

Abundance - the proportion (%) of the exposed surface occupied by mottles.

Few	< 2 %
Common	2 – 20 %
Many	> 20 %

Size - the diameter of the mottle if round, or the greatest dimension if length is not more than two or three times the width, or the width if the mottle is long and narrow.

Fine	< 5 mm
Medium	5 – 15 mm
Coarse	> 15 mm

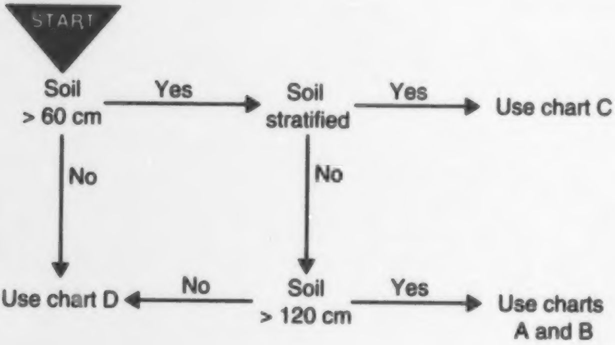
Contrast - the difference between the mottle color and the matrix color using the Munsell Soil Color Charts.

	Difference from matrix in		
	Hue* pages	Value* units	Chroma* units
Faint	0	≤ 2	≤ 1
	1	0	0
Distinct	0	3 – 4	2 – 4
	1	≤ 2	≤ 1
Prominent	0	≥ 4	≥ 4
	1	≥ 2	≥ 1
	2 +	≥ 0	≥ 0

*Hue, Value and Chroma differences are determined using the Munsell Soil Color Charts - e.g. common, fine, distinct brown (10 YR 5/3) mottles. Values in the table are taken from 1982 CanSIS manual for describing soils in the field.

Determining Soil Moisture Regime and Drainage

1. Determine organic matter depth, mineral soil depth, texture, structure, pore pattern, coarse fragment content and stratification.
2. If mineral soil is stratified and depth is > 60 cm use "Effective Texture in Stratified Mineral Soils – Chart C" (page F 17) to determine the effective texture.
3. If organic matter depth is > 40 cm or mineral soil depth is 120 cm, use "Soil Moisture Regime for Deep Soils – Chart A" (page F 12) to determine moisture regime, and "Deep Soil Drainage Class – Chart B" (page F 16) to determine soil drainage.
4. If mineral soil depth is < 120 cm, use "Soil Moisture Regime and Drainage for Shallow Soils – Chart D" (page F 18) to determine both moisture regime and drainage.


START
Soil > 60 cm
Yes
Soil stratified
Yes
Use chart C
No
No
Use chart D
No
Soil > 120 cm
Yes
Use charts A and B

Soil Moisture Regime for Deep Soils (Chart A)

Using This Chart

This chart is for rating the moisture regime of a site in the field by examination of soil physical properties and soil profile characteristics.

Soil Moisture Regime is an integration of all the variations in soil moisture supply throughout the complete vegetation cycle. The moisture regime classes are inferred from the pore pattern and depth of the mineral soil material, the topographic position of the site and characteristics of the soil profile such as mottling or grey gley horizons, which indicate impeded drainage.

If the depth of organic material over mineral soil is less than that required for an organic soil (see right side of chart) and the mineral soil depth is >120 cm over bedrock, first determine the pore pattern from the texture, allowing for an increased pore pattern if significant compaction is evident (left side of chart). Next, determine if and where mottles (designated "g") or a grey gley layer (designated "G") are present in the soil profile. If g and G are absent, proceed horizontally into the centre section of the chart, along the appropriate pore pattern line, to the shaded box. If the box is labelled "ALL SLOPES" read the moisture regime class at the top of that column. If the box has a slope designation ("s"), determine the degree of slope on which the site is located, then choose the appropriate box between the shaded box and the box to the left and read the moisture regime at the top of the appropriate column. If g or G is present, measure the minimum depth from the top of the mineral soil to g or G and proceed horizontally along the appropriate pore pattern line to the box containing the correct depth value. Then read the moisture regime class at the top of that column, e.g. fresh (2).

For organic soils, determine if the depth of organic material exceeds the criterion for MR 7. If this is so, choose between MR 8 and MR 9 as indicated. If this is not so, determine the depth from mineral surface to g and decide if this meets the MR 7 criterion (g: 0 to 5 cm) or if the mineral soil criteria are to be used to rate the moisture regime in a class lower than 7.

Pore pattern indicates the numbers and sizes of spaces (pores) between the soil particles which determine the drainage and moisture retention characteristics of the soil. The classes are inferred from soil texture, structure and compaction.

Significant compaction can increase the pore pattern, usually by one class.

...Soil Moisture Regime for Deep Soils (Chart A)

Symbols

g a layer with distinct or prominent mottles indicative of periodic saturation and aeration.

g: 15 to 30	the top of the mottled layer lies between 15 and 30 cm below the mineral surface.

G a grey gley layer indicative of prolonged saturation.

G: 60 to 90	the top of the grey gley layer lies between 60 and 90 cm below the mineral surface.
G < 45	the top of the grey gley layer lies within 45 cm of the mineral surface.

s degree of slope which results in significant surface runoff.

☐ the normal site with no slope or drainage restrictions.

Soil Drainage is the rapidity and extent of removal of water from soils in relation to additions.

W/R	most probable drainage class(es): the dominant drainage class is shown in the first position.
VR	very rapid
R	rapid
W	well
MW	moderately well
I	imperfect
P	poor
VP	very poor

O	organic horizons developed mainly from mosses, rushes and woody material (numbers indicate depth of O).
Of	(fibric) the least decomposed organic horizon containing large amounts of well-preserved fibre.
Om	(mesic) an intermediately decomposed organic horizon with properties intermediate to an Of and Oh horizon.
Oh	(humic) the most decomposed horizon containing only small amounts of well-preserved fibre and the major amount of material at an advanced stage of decomposition.

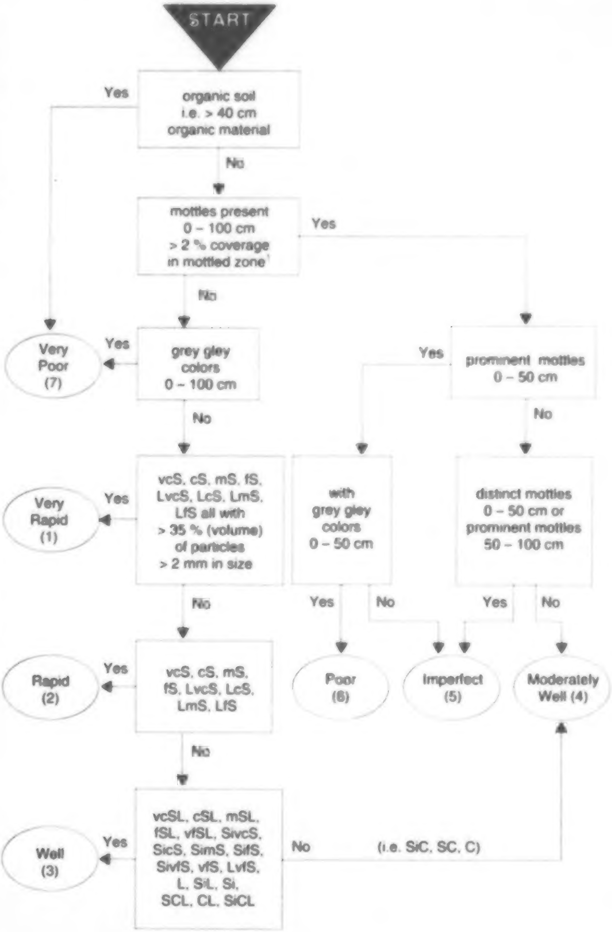
...Soil Moisture Regime for Deep Soils (Chart A)

Deep Mineral Soils (≥ 120 cm)

Pore Pattern of Mineral Soil Material			Soil Moisture Regime				
			Dry (d)		Fresh (f)		
Mineral Soil Texture (uncompacted parent material)	Pore Pattern		dry	mod. dry	mod. fresh	fresh	very fresh
			e	0	1	2	3
All material > 2 mm	extremely open	e	all slopes VR				
very coarse and coarse sands; loamy very coarse and coarse sands	very open	0		all slopes R/VR	g: 100–180 or G: 150–200 R/VR	g: 80–100 or G: 120–150 MW/I	g: 50–80 or G: 90–120 MW/I
medium sand; loamy medium sand	open	1		all slopes R/VR	g: 100–180 or G: 180–240 R/VR	g: 80–100 or G: 150–180 MW/I	g: 50–80 or G: 90–150 MW/I
fine sand; loamy fine sand; silty fine sand	moderately open	2			all slopes R/W	g: 100–150 or G: 150–210 R/W	g: 60–100 or G: 120–150 MW/I
sandy loam; very fine sand; loamy very fine sand; silty very fine sand	moderately retentive	3				all slopes W	g: 60–120 or G: 150–210 MW/I
loam; silt loam; sandy clay loam; structured silty clay and clay (aggregates < 10 mm)	retentive	4				all slopes W/MW	g: 60–120 MW/I
silt; silty clay loam; clay loam; sandy clay structured silty clay and clay (aggregates > 10 mm)	very retentive	5			s > 100 % W/MW	s < 100 % MW/W	g: 60–120 MW/I
structureless silty clay and clay	moderately restrictived	6			s > 70 % MW	s < 70 % MW	g: 60–120 MW/I
porous or fractured bedrock	restricted to very restrictived	7 8					
non-porous bedrock	extremely restricted	9					

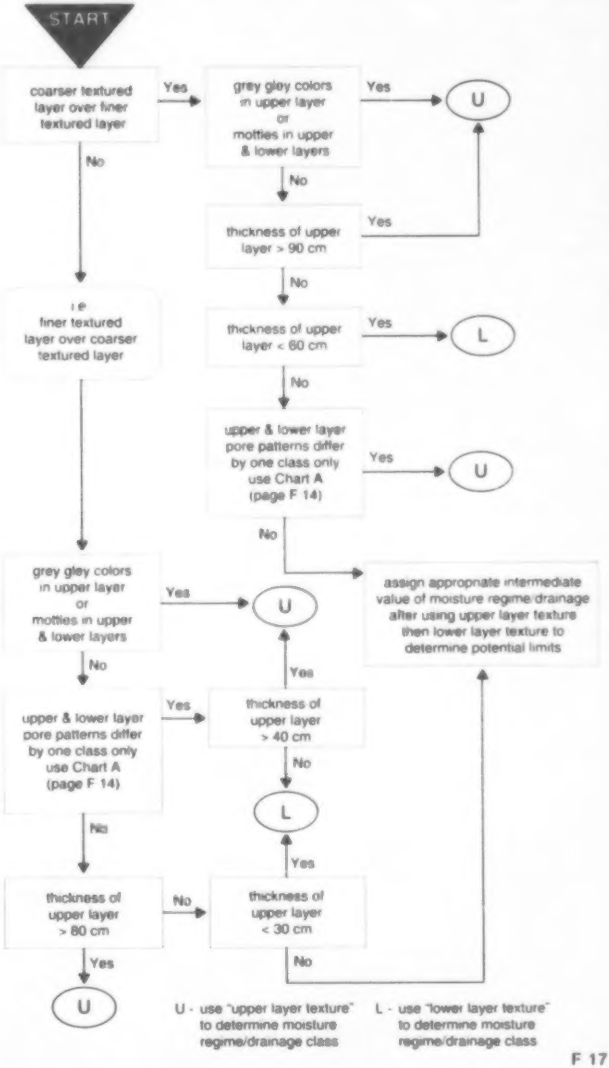
Deep Mineral Soils (≥ 120 cm)			Wet Organic Soils		
Soil Moisture Regime					
Moist (m)			Wet (w)		
mod. moist	moist	very moist	mod. wet	wet	very wet
4	5	6	7	8	9
			Of: 60–160 or Om: 40–100 or Oh: 40–100 with g: 0–5 if g is > 5 use mineral soil criteria ↙ VP	Of: > 160 or Om: > 100 or Oh: >100 with upper part not saturated all year and G present to top of mineral soil VP	Of: > 160 or Om: > 100 or Oh: >100 with saturation to surface all year and G present to top of mineral soil VP
g: 30–50 or G: 60–90 MW/I	g: 15–30 or G: 45–60 I/P	g: 5–15 or G: < 45 P/I			
g: 30–50 or G: 60–90 MW/I	g: 15–30 or G: 45–60 I/P	g: 5–15 or G: < 45 P/I			
g: 40–60 or G: 60–120 MW/I	g: 20–40 or G: 45–60 I/P	g: 5–20 or G: < 45 P/I			
g: 40–60 or G: 90–150 MW/I	g: 20–40 or G: 60–90 I/P	g: 5–20 or G: < 60 P/I			
g: 45–60 MW/I	g: 30–45 I/P	g: 5–30 P/I			
g: 45–60 MW/I	g : 30–45 I/P	g: 5–30 P/I			
g: 45–60 MW/I	g : 30–45 I/P	g: 5–30 P/I			

Deep Soil Drainage Class (Chart B)


START
organic soil i.e. > 40 cm organic material
Yes
No
mottles present 0 – 100 cm > 2 % coverage in mottled zone¹
Yes
No
Very Poor (7)
Yes
grey gley colors 0 – 100 cm
Yes
prominent mottles 0 – 50 cm
No
No
Very Rapid (1)
Yes
vcS, cS, mS, fS, LvcS, LcS, LmS, LfS all with > 35 % (volume) of particles > 2 mm in size
with grey gley colors 0 – 50 cm
distinct mottles 0 – 50 cm or prominent mottles 50 – 100 cm
No
Yes
No
Yes
No
Rapid (2)
Yes
vcS, cS, mS, fS, LvcS, LcS, LmS, LfS
Poor (6)
Imperfect (5)
Moderately Well (4)
No
Well (3)
Yes
vcSL, cSL, mSL, fSL, vfSL, SivcS, SicS, SimS, SifS, SivfS, vfS, LvfS, L, SiL, Si, SCL, CL, SiCL
No
(i.e. SiC, SC, C)

1. Exclude mottles that are few and faint (see page F 10)

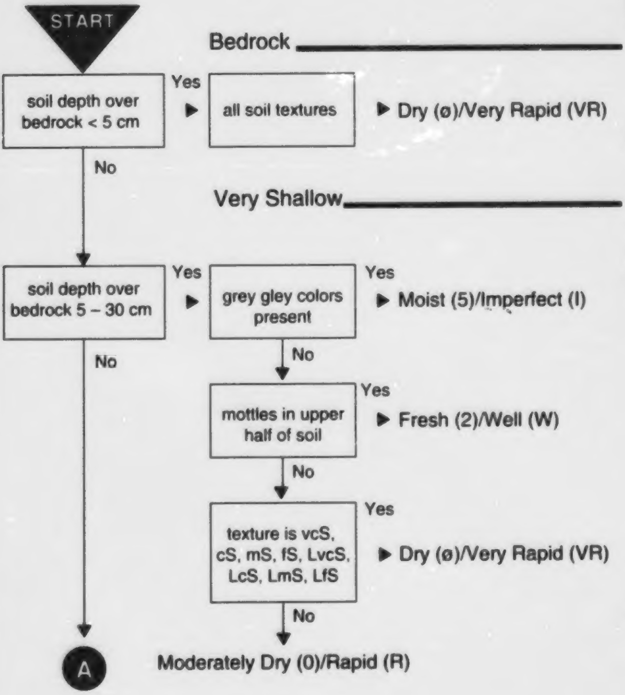
Effective Texture in Stratified Mineral Soils (Chart C)


START
coarser textured layer over finer textured layer
Yes
grey gley colors in upper layer or mottles in upper & lower layers
Yes
U
No
thickness of upper layer > 90 cm
Yes
No
thickness of upper layer < 60 cm
Yes
L
No
upper & lower layer pore patterns differ by one class only use Chart A (page F 14)
Yes
U
No
assign appropriate intermediate value of moisture regime/drainage after using upper layer texture then lower layer texture to determine potential limits
No
i.e. finer textured layer over coarser textured layer
grey gley colors in upper layer or mottles in upper & lower layers
Yes
U
Yes
No
upper & lower layer pore patterns differ by one class only use Chart A (page F 14)
Yes
thickness of upper layer > 40 cm
No
L
Yes
No
thickness of upper layer > 80 cm
No
thickness of upper layer < 30 cm
No
Yes
U

U - use "upper layer texture" to determine moisture regime/drainage class

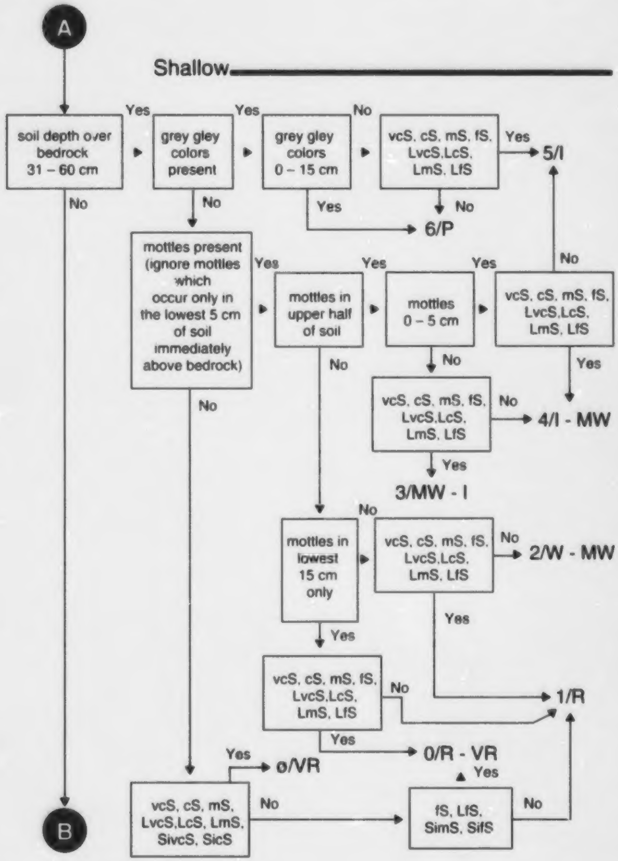
L - use "lower layer texture" to determine moisture regime/drainage class

Soil Moisture Regime and Drainage for Shallow Soils (Chart D)

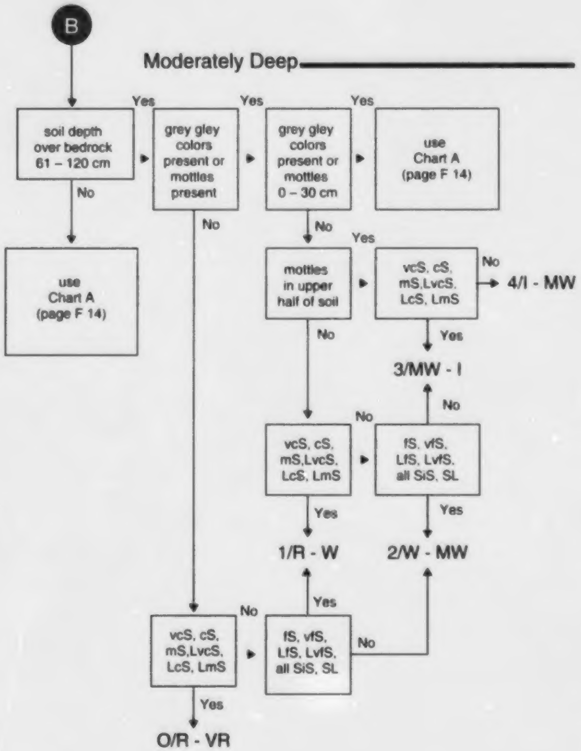

START
Bedrock
soil depth over bedrock < 5 cm
Yes
all soil textures
Dry (0)/Very Rapid (VR)
No
Very Shallow
soil depth over bedrock 5 – 30 cm
Yes
grey gley colors present
Yes
Moist (5)/Imperfect (I)
No
No
mottles in upper half of soil
Yes
Fresh (2)/Well (W)
No
texture is vcS, cS, mS, fS, LvcS, LcS, LmS, LfS
Yes
Dry (0)/Very Rapid (VR)
No
A
Moderately Dry (0)/Rapid (R)

Note: It is difficult to differentiate between adjacent detailed (numbered) moisture regime/drainage classes because even a small difference in soil depth within the very shallow soils results in a large difference in the moisture retained for plant growth. Consequently, the broad moisture regime/drainage classes are indicated first. The numbered/lettered classes shown in the brackets merely indicate the centres of the broad classes.

...Soil Moisture Regime and Drainage for Shallow Soils (Chart D)


A
Shallow
soil depth over bedrock 31 – 60 cm
Yes
grey gley colors present
Yes
grey gley colors 0 – 15 cm
No
vcS, cS, mS, fS, LvcS,LcS, LmS, LfS
Yes
5/I
No
No
Yes
No
6/P
mottles present (ignore mottles which occur only in the lowest 5 cm of soil immediately above bedrock)
Yes
mottles in upper half of soil
Yes
mottles 0 – 5 cm
Yes
vcS, cS, mS, fS, LvcS,LcS, LmS, LfS
No
Yes
No
No
vcS, cS, mS, fS, LvcS,LcS, LmS, LfS
No
4/I - MW
Yes
3/MW - I
No
No
mottles in lowest 15 cm only
vcS, cS, mS, fS, LvcS,LcS, LmS, LfS
No
2/W - MW
Yes
Yes
vcS, cS, mS, fS, LvcS,LcS, LmS, LfS
No
1/R
Yes
0/R - VR
Yes
ø/VR
Yes
vcS, cS, mS, LvcS,LcS, LmS, SivcS, SicS
No
fS, LfS, SimS, SifS
No
B

...Soil Moisture Regime and Drainage for Shallow Soils (Chart D)


B
Moderately Deep
soil depth over bedrock 61 – 120 cm
Yes
No
use Chart A (page F 14)
grey gley colors present or mottles present
Yes
No
grey gley colors present or mottles 0 – 30 cm
Yes
No
use Chart A (page F 14)
mottles in upper half of soil
Yes
No
vcS, cS, mS,LvcS, LcS, LmS
No
4/I - MW
Yes
3/MW - I
No
vcS, cS, mS,LvcS, LcS, LmS
Yes
1/R - W
fS, vfS, LfS, LvfS, all SiS, SL
Yes
2/W - MW
vcS, cS, mS,LvcS, LcS, LmS
Yes
O/R - VR
No
fS, vfS, LfS, LvfS, all SiS, SL
Yes
No

Mineral Soil Horizon Descriptions

Horizon	Description
Ah, Ap	Dark colored, surface mineral horizons, enriched with organic matter (p - man modified e.g. plow layer).
Ae	Light colored near surface horizon. Horizon of loss of iron, aluminium, organic matter or clay.
AB	A transition horizon from A to B.
Bt	Brownish, subsurface horizon, enriched with clay that has been moved from the Ae horizon.
Bm	Brownish, subsurface horizon with only slight addition of iron, aluminium or clay.
Bf, Bhf	Reddish brown subsurface horizon with significant accumulation of iron, aluminium and/or organic matter.
Bg, Cg	Horizons with grey gley colors or mottling or both.
BC	A transition horizon from B to C.
C	Relatively unweathered material from which the soil profile has developed.
Ck	A C horizon containing calcium and/or magnesium carbonates that will effervesce with dilute HCl.
j	Used with suffixes e, f, g and t to denote a weak expression of the modifying condition (e.g. Cgj, Bfj).
Solum	A & B horizons in which the parent material (C) has been modified.
Of, Om, Oh	Organic horizons developed mainly from mosses and rushes. Poor drainage conditions. The state of decomposition is denoted by: f fibric, poorly decomposed m mesic, moderately decomposed h humic, well-decomposed

Roman Numerals

Roman numerals preceding the horizon designation indicate a significant change in texture (mode of deposition) within the profile, e.g. where silt loam occurs over coarse sand the horizons of coarse sand are preceded by "II". Soil surveys done prior to 1960 used "D" horizon designation to indicate this second material.

Drainage Classes

In some soil survey reports and maps, drainage terms other than those shown on page F 13 are used. The correlation for those terms is given below.

Term	**Soil Drainage Class(es)**
excessive	very rapid, rapid
good	rapid, well, moderately well
fair	imperfect

Organic Soil Horizon Descriptions

L, F, H	Organic horizons developed primarily from the accumulation of leaves, twigs and woody materials with or without a minor component of mosses; usually not saturated for prolonged periods (> 17 percent organic carbon [approximately 30 percent organic matter by weight]).
L	Characterized by an accumulation of mainly leaves (and needles), twigs and woody materials in which the original structures are easily discernible.
F	Characterized by an accumulation of partly decomposed organic matter derived mainly from mosses, leaves, twigs and woody materials; some of the original structures difficult to recognize; materials may be partly mingled with mineral particles by soil fauna as in a MODER, or it may be a partly decomposed mat permeated by fungal hyphae as in a MOR.
H	Characterized by the accumulation of decomposed organic matter in which the original structures are indiscernible; differs from the F by having greater humification, chiefly due to the action of organisms; it may be sharply delineated from the mineral soil as in a MOR where humification is chiefly dependent upon fungal activity, or it may be partially incorporated into the mineral soil as in a MODER (see Hi horizon).
Hi	Characterized by an accumulation of spherical or cylindrical organic granules (animal droppings) with considerable inter-mixing with mineral particles; genetically, an intermediate stage between an H and an Ah horizon.
Ah	A mineral horizon enriched with organic matter (< 17 percent organic carbon by weight). MULL humus forms are entirely incorporated into the mineral soil (i.e. are without L, F, H horizons).
Of, m, h	Organic horizons developed mainly from mosses, rushes and woody material (17 percent organic carbon [approximately 30 percent organic matter by weight]). Soils with organic horizons have PEATY MOR humus forms.
Of	(Fibric) the least decomposed organic horizon containing large amounts of organic fibre (von Post 1 to 4).

...Organic Soil Horizon Descriptions

Om	(Mesic) a moderately decomposed organic horizon with properties intermediate to an Of and Oh (von Post 5 and 6).
Oh	(Humic) the most decomposed organic horizon containing only small amounts of well preserved fibre and the major amount of material at an advanced stage of decomposition

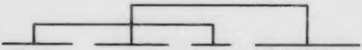
Additional Adjective Descriptions for MORS

F-horizons

hypno	feathermosses
sphagno	sphagnum mosses
licheno	lichens
ericaceo	ericaceous leaves and roots
conifero	conifer needles
dedicuo	deciduous leaves
gramino	grasses and sedges

H-horizons

granulo	granular
amorpho	amorphous
mycelio	fungal hyphae mat
rhizo	rootlet network



example: sphagno – amorpho – Fibri – HUMIMOR

Degree of Decomposition of Organic Material

von Post Scale of Decomposition

The von Post scale is used to estimate the degree of decomposition in organic soil materials. In this field test, squeeze a sample of the organic material within your closed hand to remove almost all excess water. Squeeze sample one final time and observe the color of the solution that is expressed between your fingers, the nature of the fibres, and the proportion of the original sample that remains in your hand. Ten classes are defined as follows:

FIBRIC (Of)

1. **Undecomposed**: plant structure unaltered; yields only clear water colored light yellow brown.
2. **Almost undecomposed**: plant structure distinct; yields only clear water colored light yellow brown.
3. **Very weakly decomposed**: plant structure distinct; yields distinctly turbid brown water, no peat substance passes between your fingers, residue not mushy.
4. **Weakly decomposed**: plant structure distinct; yields strongly turbid water, no peat substance escapes between your fingers, residue rather mushy.

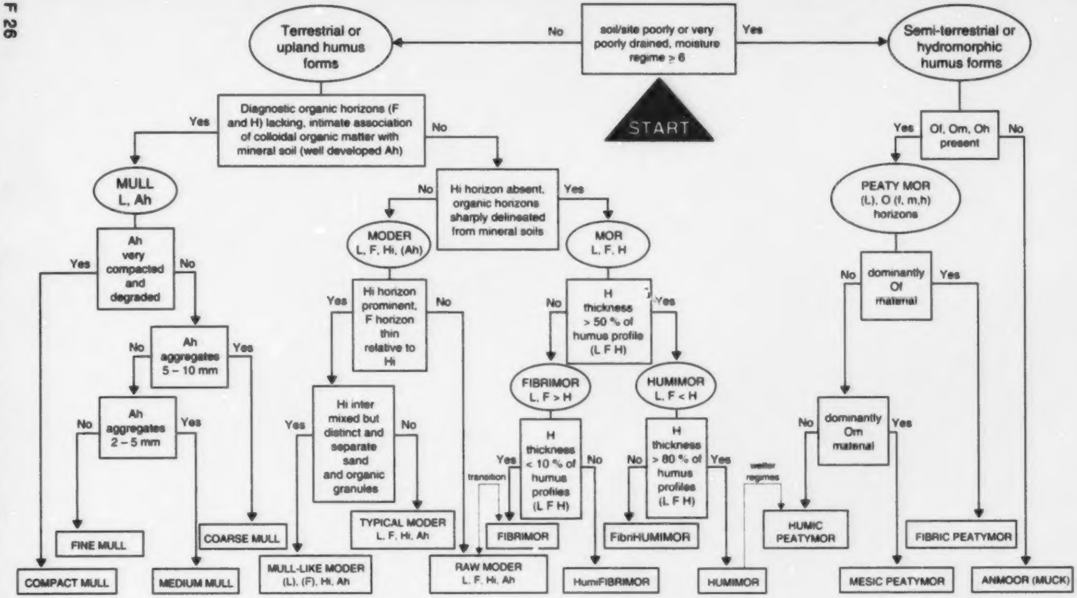
MESIC (Om)

5. **Moderately decomposed**: plant structure clear but becoming indistinct; yields much turbid brown water, some peat escapes between your fingers, residue very mushy.
6. **Strongly decomposed**: plant structure somewhat indistinct but clearer in the squeezed residue than in the undisturbed peat; about a third of the peat escapes between your fingers, residue strongly mushy.

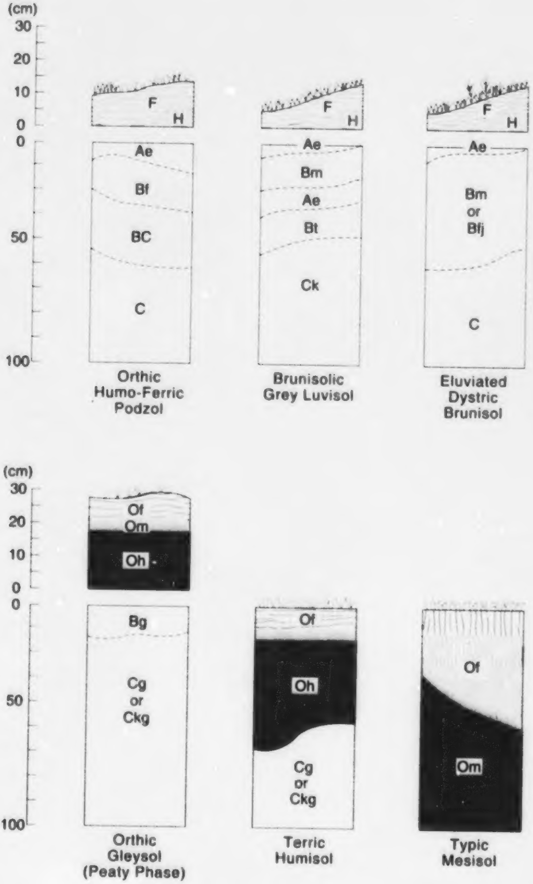
HUMIC (Oh)

7. **Strongly decomposed**: plant structure indistinct but recognizable, about half the peat escapes between your fingers.
8. **Very strongly decomposed**: plant structure very indistinct; about two-thirds of the peat escapes between your fingers, residue almost entirely resistant remnants such as root fibres and wood.
9. **Almost completely decomposed**: plant structure almost unrecognizable; nearly all the peat escapes between your fingers.
10. **Completely decomposed**: plant structure unrecognizable; all the peat escapes between your fingers.

Forest Humus Classification


soil/site poorly or very poorly drained, moisture regime ≥ 6
START
No
Yes
Terrestrial or upland humus forms
Semi-terrestrial or hydromorphic humus forms
Diagnostic organic horizons (F and H) lacking, intimate association of colloidal organic matter with mineral soil (well developed Ah)
Yes
No
MULL L, Ah
Hi horizon absent, organic horizons sharply delineated from mineral soils
No
Yes
MODER L, F, Hi, (Ah)
MOR L, F, H
Of, Om, Oh present
Yes
No
PEATY MOR (L), O (f, m,h) horizons
Ah very compacted and degraded
Yes
No
Ah aggregates 5 – 10 mm
No
Yes
Ah aggregates 2 – 5 mm
No
Yes
Hi horizon prominent, F horizon thin relative to Hi
Yes
No
Hi inter mixed but distinct and separate sand and organic granules
Yes
No
H thickness > 50 % of humus profile (L F H)
No
Yes
FIBRIMOR L, F > H
HUMIMOR L, F < H
H thickness < 10 % of humus profiles (L F H)
Yes
No
transition
H thickness > 80 % of humus profiles (L F H)
No
Yes
water regimes
dominantly Of material
No
Yes
dominantly Om material
No
Yes
FINE MULL
COARSE MULL
COMPACT MULL
MEDIUM MULL
TYPICAL MODER L, F, Hi, Ah
MULL-LIKE MODER (L), (F), Hi, Ah
RAW MODER L, F, Hi, Ah
FIBRIMOR
HumiFIBRIMOR
FibriHUMIMOR
HUMIMOR
HUMIC PEATYMOR
MESIC PEATYMOR
FIBRIC PEATYMOR
ANMOOR (MUCK)

Some Typical Soil Profiles, Northern Ontario


(cm)
30
20
10
0
0
50
100
F
H
Ae
Bf
BC
C
Orthic Humo-Ferric Podzol
F
H
Ae
Bm
Ae
Bt
Ck
Brunisolic Grey Luvisol
F
H
Ae
Bm or Bfj
C
Eluviated Dystric Brunisol
(cm)
30
20
10
0
0
50
100
Of
Om
Oh
Bg
Cg or Ckg
Orthic Gleysol (Peaty Phase)
Of
Oh
Cg or Ckg
Terric Humisol
Of
Om
Typic Mesisol

Note: 1. Depth/thickness scale are different for the forest floor and the mineral soil.

2. Horizon sequences and horizon thicknesses do vary from site to site. These diagrams represent the range of typical soil profiles.

Introduction to Plant Section

This section contains a description of the diagnostic features, an illustration, and a photograph of each plant species referred to in the keys for the FEC system as well as for a few other common forest plants. The charts on pages G 2 to G 15 provide simple keys to help identify plant species. Use this section for the field recognition of plants referred to in the ecosite and vegetation type keys.

Although this section is organized by scientific name, the common names are also provided. Scientific to common, scientific to French, common to scientific and French to scientific cross references are provided in Appendix A for all the species mentioned in the guide.

Nomenclature for plant species follows Newmaster *et al.* (1998).

This section does not provide a complete guide to the flora of northeastern Ontario. Additional plant identification texts are listed in the reference section (pages I 27 to I 31).

Plant Identification Keys
Coniferous Trees

Leaf Type and Species	Twig	Leaf				Mature Seed Cones	
Needle-leaved Evergreen	Surface	Number	Position	Attachment	Shape/Length	Size	Characteristics
Abies balsamea Balsam fir	smooth to slightly hairy	single	spiral	round suction-cup-like base	flattened 2 – 4 cm long	5 – 10 cm long	upright, purplish; rounded scales & spine tipped bract
Picea mariana Black spruce	short rusty hairy	single	spiral	on woody pegs	4-sided (rolls between fingers) 0.5 – 1.5 cm long	2 – 3 cm long	drooping, purplish to dark brown; scales with ragged edge and no prickles
Picea glauca White spruce	hairless	single	spiral	on woody pegs	4-sided (rolls between fingers) about 2 cm long	5 – 7 cm long	drooping, reddish to light brown; scales with entire edge, no prickles
Pinus banksiana Jack pine	hairless	2 in each cluster	spiral clusters	papery sheath at base	rounded outside flattened inside 2 – 4 cm long	2.5 – 8 cm long	curved or twisted brown; scales without prickles
Pinus resinosa Red pine	hairless	2 in each cluster	spiral clusters	papery sheath at base	rounded outside flattened inside 10 – 15 cm long	3 – 7 cm long	symmetrical, brown; scales with prickles
Pinus strobus White pine	short rusty hairy	5 in each cluster	spiral clusters	papery sheath at base, fall off early	rounded outside with angled sides 7 – 13 cm long	8 – 20 cm long	symmetrical, greyish brown; scales without prickles
Needle-leaved Deciduous							
Larix laricina Larch	hairless	single or clustered, 10 – 20 on spur twig	spiral	stalkless, fall off each autumn	triangular in cross section 2 – 3 cm long	1 – 2 cm long	upright, light brown; scales without prickles
Scale-leaved Evergreen							
Thuja occidentalis White cedar	hairless, in flattened sprays	single	opposite in alternate pairs	bases fused to twig forming ridges along the twig	flat on top and bottom of twig, folded on sides 2 – 4 mm long	0.8 – 1.3 cm long	upright, light brown; scales opposite, smooth without prickles

Leaf Type and Species	Twigs/Bark	Leaf			Flower		Fruit
Leaves Simple	**Surface**	**Position**	**Margin**	**Leaf Underside**	**Color**	**Location**	**Color/Type**
Betula papyrifera White birch	smooth, at times hairy, without wintergreen taste; bark white papery	alternate (stalks round)	single to double-toothed	slightly hairy and mainly on veins	greenish	in male and female catkins on same tree	greenish elongate drooping female catkins, to 5 cm long at maturity
Betula alleghaniensis Yellow birch	slightly hairy, with wintergreen taste; bark yellowish with papery curls	alternate (stalks round)	double-toothed	soft downy hairy, especially where side veins meet the midrib	greenish	in male and female catkins on same tree	greenish oblong erect female catkins, 2 – 4 cm long at maturity
Populus balsamifera ssp. *balsamifera* Balsam poplar	smooth; bark greenish grey becoming furrowed with flat ridges	alternate (stalks round)	fine rounded teeth	hairless with brownish resin blotches	greenish	in male and female catkins on separate trees (scales not lobed)	greenish capsules with fluffy-hairy seeds
Populus tremuloides Trembling aspen	smooth waxy; bark greenish grey, becoming furrowed with flat ridges	alternate (stalks flat)	fine rounded teeth	smooth without resin blotches	greenish	in male and female catkins on separate trees (scales 3 – 5 lobed)	greenish capsules with fluffy-hairy seeds
Acer rubrum Red maple	red, shiny, hairless; bark grey brown with long narrow plates	opposite (stalks round)	5-lobed with V notches & toothed	hairless when mature	red (5 small petals)	in male and female clusters on same tree	paired reddish keys, each 1.5 – 2 cm long
Acer saccharum ssp. *saccharum* Sugar maple	reddish brown, shiny, hairless; bark dark grey with elongate curled ridges	opposite (stalks round)	5-lobed with U notches & toothed	hairless	yellowish (without petals)	in male, female and bisexual clusters on same tree	paired reddish brown keys, each 2.5 – 4 cm long

...Plant Identification Keys
Deciduous Flowering Trees/Coniferous Shrubs

Leaf Type and Species	Twig/Bark	Leaf			Flower		Fruit
Leaves Compound	**Surface**	**Position**	**Margin**	**Leaf Underside**	**Color**	**Location**	**Color/Type**
Fraxinus nigra Black ash	light grey, hairless; bark of corky ridges that easily rub off	opposite (stalks round); 7 – 11 stalkless leaflets	finely toothed	rusty tufts of hairs at base of leaflets	greenish (without petals)	unisexual and bisexual, in dense dangling clusters; male and female usually on separate trees	single, light brown keys, 4 cm long, in dangling clusters; seed entirely surrounded by wing

Coniferous Shrubs

Leaf Type and Species	Twig	Leaf				Mature Seed Cones	
Needle-leaved Evergreen	**Surface**	**Number**	**Position**	**Attachment**	**Shape/Length**	**Size**	**Characteristics**
Taxus canadensis Ground hemlock	ridged, becoming scaly with age	single	spiral	stalk attached to narrow green ridge on twig	flattened 1 – 2.5 cm long	5 – 10 mm across	drooping, round, bright red, berry-like; brown seed visible

Coniferous Flowering Shrubs

Shrub Type and Species	Twig	Leaf			Flower		Fruit
Evergreen/Erect	**Surface**	**Position**	**Margin**	**Leaf Underside**	**Color**	**Number/Location**	**Color/Type**
Andromeda polifolia ssp. *glaucophylla* - Bog rosemary	hairless	alternate	entire	white hairy	white/pink	several, clustered	brown capsule
Ledum groenlandicum Labrador-tea	hairy	alternate	entire	brown hairy	white	many, clustered	brown capsule
Chamaedaphne calyculata Leatherleaf	hairy	alternate	entire	rusty scales	white	singly	brown capsule
Gaultheria procumbens *Wintergreen*	hairy above, hairless below	alternate	toothed; teeth bristle-tipped	hairless	white	singly	red, berry-like capsule
Kalmia angustifolia Sheep laurel	short hairy when young; older stems hairless	opposite and whorled	entire, sometimes somewhat enrolled	nearly hairless	pink to purple	many, clustered	brown capsule
Kalmia polifolia Pale laurel	hairless	opposite	entire	white hairy	pink	many, clustered	brown capsule
Evergreen/Trailing							
Gaultheria hispidula Creeping snowberry	hairy	alternate	entire	bristly brown hairy	white	singly	white berry
Oxycoccus microcarpus Small cranberry	hairless	alternate	entire	white waxy layer	pink	several, clustered	red berry
Epigaea repens Trailing arbutus	hairy	alternate	entire	hairy	white/pink	several, clustered	brown capsule
Linnaea borealis ssp. *longiflora* - Twinflower	hairy	opposite	toothed	short hairy	pink	paired	brown capsule

...Plant Identification Keys
Deciduous Flowering Shrubs

Shrub Type and Species	Twig	Leaf			Flower		Fruit
Evergreen/Erect	Surface	Position	Margin	Leaf Underside	Color	Number/Location	Color/Type
Alnus viridis ssp. *crispa* Green alder	fine hairy and sticky	alternate	single-toothed	sticky when young	greenish brown	in male and female catkins	green or brown long-stalked, plump catkins
Alnus incana ssp. *rugosa* Speckled alder	hairy, not sticky	alternate	double-toothed	fine hairs on veins	greenish brown	in male and female catkins	green or brown nearly stalkless catkins
Vaccinium angustifolium Early low blueberry	warty or wrinkled, hairless or finely hairy in lines	alternate	toothed; teeth bristle-tipped	hairless or with some fine hairs on veins	white or pale pink	several in cluster	blue or blue-black berry
Vaccinium myrtilloides Velvetleaf blueberry	densely hairy	alternate	entire	short hairy	white/pink	several in cluster	blue berry
Ribes lacustre Bristly black currant	densely sharp bristly and with prickles	alternate	5-lobed & toothed	scattered glandular hairs	yellow green to purplish	several in drooping cluster, grandular-hairy	purplish black berry with glandular hairs
Ribes glandulosum Skunk currant	mainly hairless	alternate	5-lobed & toothed	finely hairy	yellow green to purple	several in erect or arched cluster, grandular-hairy	red berry with bristly-glandular hairs
Amelanchier spp. Serviceberries	young stems hairy or hairless; older stems hairless and smooth	alternate	toothed	hairy or hairless	white	usually in several to many-flowered clusters, sometimes singly	reddish-purple to black, berry-like pome
Corylus cornuta ssp. *cornuta* Beaked hazel	smooth with a few long hairs	alternate	double-toothed	hairy, especially on veins	yellow green	in male catkins and small female clusters	brown nut enclosed in a bristly beaked yellowish husk
Cornus stolonifera Red osier dogwood	hairless	opposite	entire	white soft hairy	creamy	rounded to flat-topped cluster	white or bluish berry-like drupe
Lonicera canadensis Canada honeysuckle	hairless, smooth when young	opposite	entire and hairy	hairless	pale yellow; can be flushed with purple	paired	paired, red, oval berries on elongated stalk

...Plant Identification Keys
Deciduous Flowering Shrubs

Shrub Type and Species	Twig	Leaf			Flower		Fruit
Evergreen/Erect	**Surface**	**Position**	**Margin**	**Leaf Underside**	**Color**	**Number/Location**	**Color/Type**
Diervilla lonicera Bush honeysuckle	fine hairs along 2 ridges	opposite	toothed	dense short hairs	yellow	2 – 7 in cluster	slender brown capsule
Lonicera villosa Northern honeysuckle	long soft hairs	opposite	entire	abundantly hairy	yellow	paired	blue berry on short hairy stalk
Acer spicatum Mountain maple	minutely hairy	opposite	3 – 5 lobed toothed	finely hairy	greenish yellow	many on upright branched cluster	paired reddish keys
Cornus canadensis Bunchberry	hairless	whorled	entire	hairless	creamy	small, clustered, surrounded by 4 showy white bracts	red berry-like drupe
Leaves Compound							
Rubus pubescens Dwarf raspberry	scattered soft hairs	alternate 3 leaflets	toothed	mainly hairless	white/pink	singley or small loose cluster	red thimble of fruitlets
Rubus idaeus ssp. *melanolasius* Wild red raspberry	young stems bristly, older stems smoother	alternate 3, 5 or 7 leaflets	toothed	whitish hairy	white	2 – 5 in grandular-hairy cluster	red thimble of fruitlets
Rosa acicularis ssp. *sayi* Bristly wild rose	stems sharp prickly	alternate 5 or 7 leaflets	toothed	hairy	pink	singley or few-flowered small cluster	red hip
Sorbus americana American mountain ash	smooth	alternate13, 15 or 17 leaflets	toothed and long leaflet tip	hairless or nearly so	white	in flat-topped to rounded branched cluster	orange red berry-like pome
Sorbus decora Showy mountain ash	smooth	alternate13, 15 or 17 leaflets	toothed and short leaflet tip	slightly hairy to somewhat whitened	white	in open rounded cluster	bright red berry-like pome

...Plant Identification Keys
Flowering Herbs

Leaf Type and Species	Leaf			Flower		Fruit
Leaves Simple with Parallel Veins*	**Position/Base**	**Margin**	**Leaf Underside**	**Color/No. of Parts**	**Number/Location**	**Color/Type**
Cintonia borealis Blue bead lily	basal, clasping	entire	hairy	yellow, 6-parted	several in cluster at top of leafless flower stalk	dark blue shiny berries on upright stalks
Maianthemum trifolium Three-leaved smilicina	alternate, clasping	entire	hairless	white, 6-parted	several in cluster at top of leafy stem	dark red berries on short stalks
Streptopus amplexifolius White mandarin	alternate, clasping	entire	hairless, glaucous	greenish-white 6-parted	singly or pairs, from leaf axils	red berry drooping on elongated, twisted stalk
Streptopus roseus Rose twisted-stalk	alternate, without stalk	minutely toothed and hairy fringe	short hairy	rose, 6-parted	singly from leaf axils	red berry drooping on elongated stalk
Maianthemum canadense Wild lily-of-the-valley	alternate, with or without a stalk	entire or hairy	hairy or hairless	white, 4-parted	many in cluster at top of leafy stem	red berries on short stalks
Carex spp. Sedges (grass-like herb, commonly with triangular solid stems, with leaf base closed and sheathing stem)	alternate (often in three rows)	entire	generally hairless	mainly greenish, 3-parted, no petals or sepals	many unisexual, in dense male, female and mixed gender spikes (clusters)	nutlet-like enclosed by a papery flask-like perigynium
Leaves Simple with Net Venation*						
Aster macrophyllus Large-leaved aster	alternate and basal; with long stalks	toothed (heart-shaped leaf base)	rough hairy on both sides	pale blue to lilac flower heads with yellow centre turning purple 5 tiny lobes	heads in flat-topped clusters with sticky glandular hairs	dandelion-like head of tiny dry fruitlets topped with parachutes of soft bristles

* Leaves whose veins all originate at the base of the blade and extend towards the tip in parallel without any obvious connections between them have parallel venation; leaves that have a midrib and side branches or those that have all their major veins spreading out from the base of the blade but are interconnected with each other are net veined.

Leaf Type and Species	Leaf			Flower		Fruit
Leaves Simple with Net Venation*	**Position/Base**	**Margin**	**Leaf Underside**	**Color/No. of Parts**	**Number/Location**	**Color/Type**
Petasites frigidus var. *palmatus* Sweet coltsfoot	basal with long stalks	toothed and deeply lobed	white hairy	creamy white, small, 5 tiny lobes	many in heads; heads in clusters in upper part of scaly-bracted stem	dandelion-like head of tiny dry fruitlets topped with parachute of soft bristles
Mitella nuda Naked mitrewort	basal with long stalk	slightly lobed and coarsely toothed	sparsely hairy below, bristly hairy above	yellow green, 5 deeply cleft petals	several to many on a thin glandular-hairy wand-like leafless stalk rising above the leaves	tiny greenish, flattened capsules with a few black shiny seeds
Epilobium angustifolium Fireweed	alternate, stalkless or with a short stalk	entire or slightly toothed	hairless	pink – purple, sometimes white, 4-parted	many in elongated cluster at top of leafy stem	green to red elongate capsule containing many seeds with tufts of hair
Viola renifolia Kidney-leaved violet	basal with long stalk	rounded shallow teeth	scattered soft hairy becoming hairless	white with purple veins, 5-parted with a short spur	singly on erect stalks projecting above the leaves	small purplish ellipsoid capsules
Galium triflorum Fragrant bedstraw	whorled (several whorls of 6 leaves) without stalk	fringed with curved bristles	backwardly-hooked bristles on midrib	greenish white, 4 tiny petals	clustered on long stalks, often 3, from top of plant and leaf whorl	tiny bilobed blackish nutlets with abundant hooked bristles

* Leaves whose veins all originate at the base of the blade and extend towards the tip in parallel without any obvious connections between them have parallel venation; leaves that have a midrib and side branches or those that have all their major veins spreading out from the base of the blade but are interconnected with each other are net veined.

...Plant Identification Keys
Flowering Herbs

Leaf Type and Species	Leaf			Flower		Fruit
Leaves Simple with Net Venation*	Position/Base	Margin	Leaf Underside	Color/No. of Parts	Number/Location	Color/Type
Trientalis borealis Starflower	whorled (at top of short stem) without stalk	entire	hairless and shiny	white, 7 pointed petals	1 – 3 born singly on long thin stalks from centre of leaf whorl	tiny pale brown erect capsules splitting into 5 parts
Leaves Compound						
Coptis trifolia Goldthread	basal with 3 leaflets with long stalk	toothed	hairless, shiny and evergreen	white, 5 – 7 colored sepals	singly on slender stalks rising above the leaves	several greenish dry fruitlets with beaks and stalks
Aralia nudicaulis Sarsaparilla	basal (3-parted each with 3 – 5 leaflets) with long stalk	toothed	hairless	greenish white, 5 tiny petals	many in several rounded clusters at top of leafless stalk	bluish black berries
Anemone quinquefolia var. *quinquefolia* Wood anemone	single, basal or three whorled on flowering stem; long stalked; leaflets 3 to apparently 5	toothed	hairy to almost hairy	white or purple tinged on outside, 4 – 7 sepals	singly on long stalk above whorl of leaves	brown dry, indehiscent fruits (achenes)

* Leaves whose veins all originate at the base of the blade and extend towards the tip in parallel without any obvious connections between them have parallel venation; leaves that have a midrib and side branches or those that have all their major veins spreading out from the base of the blade but are interconnected with each other are net veined.

Leaf Type and Species	Stem	Leaf (Frond)				Spore Cases
Leaves Simple/Sharp Scale	**Form**	**Number/Position**	**Shape**	**Size**	**Stalks**	**Position**
Huperzia lucidula Shining clubmoss	upright stems single or few-branched from trailing horizontal stem, densely covered with evergreen leaves	numerous, in 6 rows along the stems	narrow, lance-shaped	0.6 to 1.5 cm long	none	in the axils of upper leaves
Lycopodium obscurum Ground pine	upright, branched, bristly-scaly shoots in somewhat flattened fan-like sprays, from creeping rootstalk	numerous, along 6 rows of the upright shoots	narrow lance-shaped with sharp tips	about 0.6 cm long	none	protected by scales grouped into several elongate cone-like structures at top of shoots
Equisetum sylvaticum Woodland horsetail	upright, ridged, branches in whorls, fertile and sterile stems from light brown creeping underground stems	3 – 18, in whorls, joined together to form sheaths	narrow, lance shaped; with sharp tips	to about 2.7 cm on main axis of fertile stem; to about 1.3 cm on main axis of sterile stem	none	in long-stalked cones at tips of fertile stems
Gymnocarpium dryopteris Oak fern	slender black creeping rootstalk	singly and scattered along the rootstalk	broadly triangular and with 3 stalked leaflets, each again 2 – 3 times divided; leaflet segments with rounded tips	to 18 cm long	elongate, yellow green with dark base and few scales on lower half	in round clusters near margins on undersides of leaflets

Ferns and Allies

Leaf Type and Species	Stem	Leaf (Frond)				Spore Cases
Leaves Compound, Broad	**Form**	**Number/Position**	**Shape**	**Size**	**Stalks**	**Position**
Pteridium aquilinum var. *latiusculum* Bracken fern	stout, black, hairy creeping underground stem (with few roots)	singly and scattered along underground stem	broadly triangular, often divided into 3 almost equal parts, each again 2 – 3 times divided; leaflet segments with blunt tips	to about 190 cm	elongate, green turning brown with age, smooth	in narrow lines along margins on undersides of leaflets
Dryopteris carthusiana Spinulose shield fern	thick, scaly underground stem	many in circular clusters from top of stem at ground level	lance-shaped to triangular, divided into opposite leaflets below, each again divided; smallest leaf segments sharp-pointed	to about 60 cm long	elongate, light brown and densely brown scaly	in round clusters near middle on undersides of leaflets
Athyrium filix-femina ssp. *angustum* Northern lady fern	thick, scaly underground stem (with many roots)	many in circular clusters from top of stem at ground level	lance-shaped; divided into leaflets, each again divided, smallest leaf segments thin pointed or blunt tipped	to about 110 cm long	elongate, pale green to pale wine, with few pale – dark colored scales	in straight to strongly curved or horsehoe-shaped clusters, near middle of underside of leaflets

Growth Form and Species	General Appearance		Stem			Capsule
Spreading, Mat-forming	Shape	Color	Midrib	Leaf Size	Leaf Tip	Color/Size
Ptilium crista-castrensis Plume moss	semi-erect, plume-like and symmetrical with dense opposite branches becoming regularly smaller towards tip	mats glossy bright green to yellow or brown green stem greenish	double, 1/2 of blade length	3 mm long	elongate with prominently curved tips with inrolled margins facing downward (branch leaves similar, smaller)	reddish brown, 2 – 3 mm long, on elongate orange red stalks 2.5 cm long, singly
Rhytidiadelphus triquetrus Electrified cat-tail moss	creeping to ascending, plume-like and asymmetrical, with unequal and irregular branches; stem apices appear wider because of crowded leaves	mats dull or glossy green to yellowish green or yellowish brown	double, short to over half the blade length; sometimes lacking	to about 3.25 mm long	slenderly tapered, sharp tip	reddish brown, 1.5 – 3 mm long on slender red to reddish brown stalks 15 – 45 mm long
Pleurozium schreberi Schreber's moss	prostate, plume-like with branches more variable in length, not uniformly decreasing in size towards tip	mats glossy yellow green; stem red	double, short and not always visible	1.5 – 2.0 mm long	short blunt or rounded tip	reddish brown about 4 mm long on slender red stalks 2.5 cm long, singly, rarely seen
Hylocomium splendens Stair-step moss	stems arched and wiry forming yearly growths of ferny sprays in a step-like manner	mats yellowish or olive green; stem reddish to brownish	double, 1/3 – 1/2 of blade length	3 mm long	wavy curled tip (branch leaves similar but no curly tip)	reddish brown 1.5 – 2.5 mm long on slender reddish stalk 1 cm long, singly

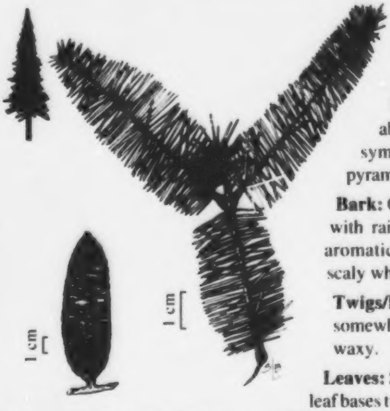
...Plant Identification Keys
Sphagnum

Growth Form and Species	General Appearance		Stem		Habitat
Upright, Clump-forming	Shape	Color	Texture/Size	Stem Leaf Size	
Sphagnum angustifolium (Yellow two-leaved peat moss)	slender, with terminal branches forming a small flat to rounded star-like head; stem branches in clusters of 4 – 5 with 2 of each thicker and widespread, others slender and drooping	greenish to yellowish brown	flexible (central core yellow green) about 9 cm high	about 0.8 mm long	open wooded fens and swamps, bog depressions, damp humus
Sphagnum fuscum (Brown bog peat moss)	delicate, lacking well-defined terminal head of branches; stem branches in clusters of 3 – 5 with all similar and drooping	dark brown, greenish or reddish brown compact cushions	flexible (central core brown) about 10 cm high	0.8 – 1.1 mm long	top of hummocks in open drier bog sites, black spruce bog forests
Sphagnum girgensohnii (Common green peat moss)	medium to large, with small flat star-shaped head and a distinct shiny terminal bud in center; stem branches in clusters of 3 – 5 with all similar and drooping	greenish to yellowish or brownish green loose carpets	stiff but flexible (central core green to brown) about 8 cm high	1.0 – 1.3 mm long (blunt tip with teeth)	damp humus to wet areas in boggy woods and white cedar swamps
Sphagnum magellanicum (Red fat-leaved peat moss)	robust appearance due to thick or swollen branches; terminal head poorly developed; stem branches in clusters of 4 – 6 with 2 – 3 per cluster thick and wide-spread, others slender and drooping	reddish or purplish carpets green when in shade	flexible (central core red) about 11 cm high	about 2 mm long	sides and tops of hummocks in moist to wet open bogs, occasionally in fens
Sphagnum capillifolium (Lady's tresses peat moss)	slender, short, sometimes forked, with small single or double terminal head of branches per plant; stem branches in clusters of 3 – 5, all same thickness and 2 wide-spread and outwardly-curving (like long hair) others drooping	green to mottled with red or pink dense carpet-like mounds	stiff (central core reddish) 5 – 8 cm high	1.0 – 1.8 mm long	on hummocks and mounds in bogs and fens, wet depressions, on humus and wet rocks in woods
Sphagnum wulfianum Wulf's peat moss	medium to large, with large rounded shaggy terminal head; stem branches in clusters of 6 – 13, with 3 – 6 wide-spread	dark green to brownish green loose carpets, occasionally pink on top	stiff, wiry and brittle, readily snaps when bent (central core red brown) about 9 cm high	about 0.7 mm long	on humus and rotting logs in moist to wet sites, common in black spruce and white cedar swamps

Species	Growth Form	Stem	Branch Patterns
Cladina stellaris var. *stellaris* Coral lichen	greenish grey, erect shruby head-like tufts, in separate or loosely clumped colonies	without a main stem	densely and finely branched, with a terminal star-like whorl of 4 – 5 tiny branchlets around a central hole
Cladina rangiferina Reindeer lichen	silver or blue grey, erect shrubby tangled clump	with a main stem	terminal branchlets not in whorls but tips browned and curved to one side

Abies balsamea – *Balsam fir*

Pine Family (Pinaceae), Sapin baumier



General: Needle-leaved, evergreen, conifer, up to 30 m high; slightly tapered trunk with persistent dead branches below crown; to about 60 cm diameter; crown symmetrical in form, narrowly pyramid shaped; roots shallow.

Bark: Greyish, smooth, when young with raised "blisters" filled with an aromatic resin, irregular brownish scaly when older.

Twigs/Buds: Greenish, smooth to somewhat hairy; buds rounded and waxy.

Leaves: Spirally arranged, single, with leaf bases twisted so that blades generally lie in one plane in flattened sprays; stalkless but with a broadly rounded base that leaves a flat round leaf scar; blade flat with a rounded to notched tip, tapered at base to the enlarged point of attachment; 2 to 4 cm long; dark green shiny upper surface, underside with two white bands, margins entire.

Cones: Male cones small, short-lived, on same tree with female cones; spring. Mature female cones cylindrical, upright, 5 to 10 cm long, greyish purple, with broadly rounded scales and conspicuous shorter bracts with a central needle-like spine on the outer edge; winged seeds mature in fall and spread by wind and small mammals.

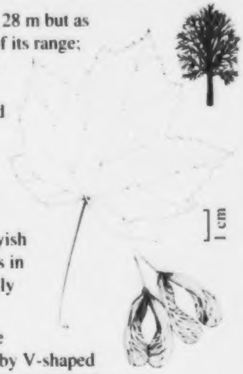
Habitat: On both mineral and organic soils in dry and wet sites; often associated with black and white spruce, trembling aspen and white birch; shade tolerant.

Notes: The flat needles and erect seed cones distinguish it from black and white spruce.

MNR Photo

Acer rubrum – ***Red maple***

Maple Family (Aceraceae), Érable rouge



General: Broadleaf, deciduous, flowering tree, to 28 m but as high as 35 m on favorable sites in southern parts of its range; trunk branching near ground when growing in the open with a broad dense crown, unbranched for half its height and with narrower crown in forested conditions; roots widespreading and shallow.

Bark: Light grey and smooth when young, to dark greyish brown with long narrow scaly plates on older trees.

Twigs/Buds: Red, shiny and hairless, turning greyish with age and having clusters of plump flower buds in late winter; buds reddish, shiny and smooth, usually with four scales with blunt tips.

Leaves: Opposite, simple, on reddish stalks; blade with three to five sharply pointed lobes separated by V-shaped notches (sinuses) with the leaf base flattened to heart-shaped; five to 15 cm in diameter, about as wide as long, bright green above, whitish below and somewhat hairy when young, hairless on both sides when mature; margins irregularly double-toothed; turn deep red or scarlet in the fall.

Flowers: Red, unisexual, in dense separate male and female clusters with both sexes on the same or different trees; male flowers short stalked, female flowers on elongate drooping stalks; five small and non-showy petals; May, before the leaves unfold.

Fruit: Paired reddish winged keys (samaras), each about 1.5 to 2 cm long and with a single plump seed; June to July.

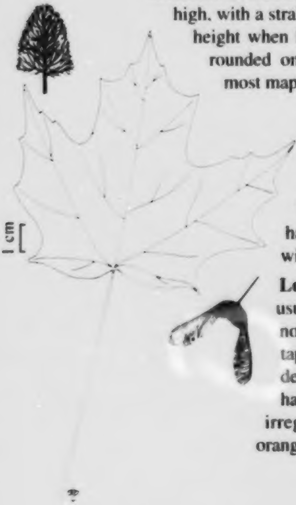
Habitat: Usually on rich moist sites; along banks of streams and in swamps, occasionally on dry well-drained sites. At the northern end of its range in northeastern Ontario, occurring on sites with warmer than normal microclimates.

Notes: Appropriately named because of its reddish buds, leafstalks, flowers, fruits and fall coloring of the leaves.

MNR Photo

Acer saccharum ssp. saccharum – Sugar maple

Maple Family (Aceraceae), Érable à sucre



General: Boadleaf, deciduous, flowering tree, to 30 m or more high, with a straight trunk, unbranched for two thirds of its height when forest grown, diameter to 150 cm; crown rounded on top; roots widespread and deeper than most maples.

Bark: Smooth and grey when young, becoming dark grey with irregular elongate strips curling outward along one side (winged ridges).

Twigs/Buds: Reddish brown, shiny and hairless; buds reddish brown, pointed and with sparsely hairy scales.

Leaves: Opposite, simple, stalked; blade usually five-lobed with rounded or U-shaped notches, terminal lobe almost square and tapering to a slender point; 8 to 15 cm across; deep yellowish green above, paler below, hairless on both surfaces; margins with few irregular teeth; turning yellow to brilliant orange or scarlet in the fall.

Flowers: Yellowish, unisexual and bisexual (perfect) on same tree; without petals, small on stalks to 10 cm long, in drooping clusters; appearing with the leaves in April to May.

Fruit: Paired, reddish brown winged keys (samaras), each 2.5 to 4 cm long, on slender stalks, with a plump smooth seed; autumn.

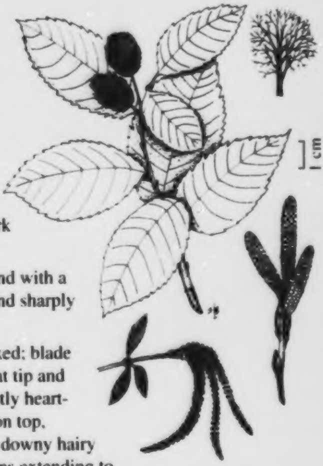
Habitat: On many types of soils, but preferring well-drained fertile loam and sandy loam soils. At the northern limit of its range in northeastern Ontario, occurring on sites with warmer than normal microclimate.

Notes: Canada's national tree and one of the tallest hardwoods. It is the chief source of maple syrup/sugar.

Wendy Copps, Blue Heron Graphics

Betula alleghaniensis – Yellow birch

Birch Family (Betulaceae), syn. Betula lutea, Bouleau jaune



General: Broadleaf, deciduous, flowering tree to 23 m high; trunk commonly branchless for half its height, to 60 cm in diameter; crown irregularly rounded; roots deep and widespreading.

Bark: Smooth and yellowish brown, turning into papery curls as it ages, but does not peel readily; old trees have thick reddish brown to black bark that breaks into flat plates.

Twigs/Buds: Brown, slightly hairy and with a wintergreen taste; buds dark brown and sharply pointed, terminal buds lacking.

Leaves: Alternate, simple, short-stalked; blade egg-shaped, tapered to a sharp point at tip and somewhat narrowed at base and slightly heart-shaped; 7 to 13 cm long; dark green on top, smooth, yellow green below and soft downy hairy on the nine to 12 or more pairs of veins extending to the larger teeth; margins sharply toothed with larger and smaller teeth.

Flowers: Greenish, unisexual, both kinds on the same tree; male flowers in elongate catkins present during the winter and opening in spring, 8 to 12 cm long; female flowers in greenish catkins, narrowly cylindrical or oblong nearly stalkless, 2 cm long, developing in spring.

Fruit: Mature female catkins develop into a greenish erect cone-like structure, 2 to 4 cm long with cone scales having three erect hairy lobes; fruitlets are small, winged nutlets, the wings narrower than the nutlet body. "Cones" may remain intact and on the tree over winter.

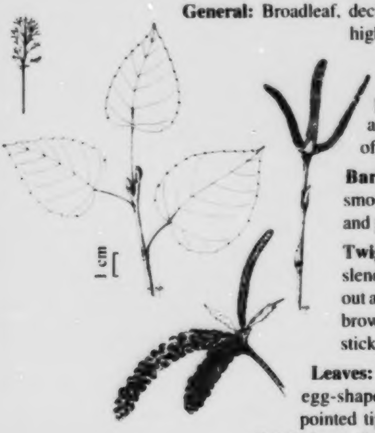
Habitat: On rich moist, well-drained soils, often in seepage areas.

Notes: Nutlets ("seeds") are late winter food for birds.

MNR, Algonquin Park

Betula papyrifera – White birch

Birch Family (Betulaceae), Bouleau à papier



General: Broadleaf, deciduous flowering tree, to 25 m high; trunk slender and somewhat curved, to 60 cm in diameter; crown oval in forest trees, pyramidal on open-grown trees and comprising most of the height of the tree; roots shallow.

Bark: Reddish brown, thin and smooth changing to whitish, papery and peeling with age.

Twigs/Buds: Dark reddish brown, slender and occasionally hairy, without a wintergreen taste; buds greenish brown, blunt to pointed and often sticky.

Leaves: Alternate, simple, stalked; blade egg-shaped to triangular with a sharp pointed tip and a flattened to rounded or slightly heart-shaped base; 5 to 10 cm long; dull green above, paler and slightly hairy below, mainly on the veins; margins single to double toothed.

Flowers: Greenish, unisexual, both kinds on the same tree; male flowers in elongate catkins present during the winter and opening in spring, to 10 cm long; female flowers in greenish catkins, narrow cylindrical, singly or in pairs, on slender stalks, catkins to 5 cm long, developing with the leaves in spring.

Fruit: Mature female catkin is dull greenish, cylindrical to 5 cm long with cone scales three-lobed and hairy but with the side lobes at right angles to the central lobe; fruitlets are small, broadly-winged nutlets, with wings wider than nutlet body; shed in early fall.

Habitat: On a variety of forest soils in dry to wet areas; common on hillsides and forest clearings, especially in areas opened up by fire. It is shade intolerant.

Notes: Traditionally used for constructing birch bark canoes, funnels, splints, spoons, dishes and artwork.

MNR Photo

Fraxinus nigra – **Black ash**

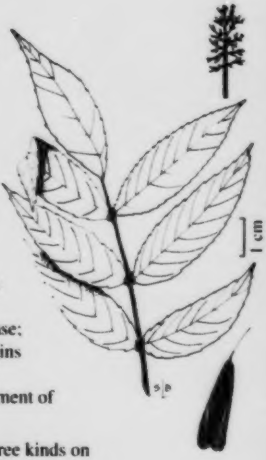
Olive Family (Oleaceae), Frêne noir

General: Broadleaf, deciduous, flowering tree, to 20 m high; trunk slender, under 50 cm in diameter; crown narrow, open, of coarse ascending branches; roots shallow and widespread.

Bark: Pale grey and flaky, developing soft corky ridges that are easily rubbed off.

Twigs/Buds: Twigs light grey, dull, hairless and stout; buds dark brown, with the top pair showing a distinct region of bark between the terminal bud and the small side buds.

Leaves: Opposite, compound, stalked; leaflets seven to 11, stalkless; leaflet blade oblong to lance-shaped, tapering to tip and rounded at base; 7 to 10 cm long; dark green and hairless; margins finely toothed; rust-colored tufts of hairs are characteristically present at the point of attachment of the leaflet base to the central leafstalk.



Flowers: Greenish, perfect or unisexual, all three kinds on same tree or unisexual flowers commonly on different trees; individual flowers inconspicuous, lacking petals; forming dense elongate dangling clusters in early spring before leaves appear.

Fruit: Winged, narrow oblong, light brown key (samara), about 4 cm long, with the single seed entirely surrounded by the papery wing; ripens in fall and remains on the tree for most of the winter.

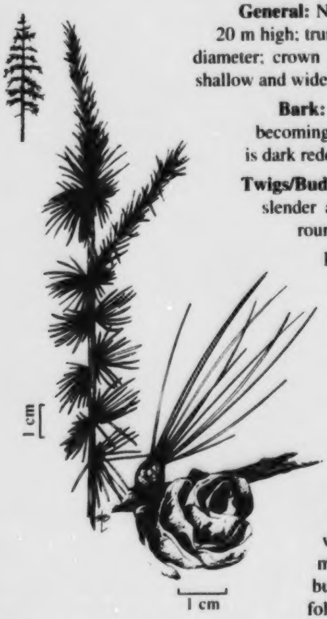
Habitat: On mineral or organic soils in moist to wet swampy areas; forms small pure localized stands or grows associated with speckled alder, balsam poplar, white cedar and red maple.

Notes: The wood is moderately hard and decay resistant.

MNR Photo

Larix laricina – **Larch**

Pine Family (Pinaceae), Mélèze laricin



General: Needle-leaved, deciduous, conifer, to 20 m high; trunk straight, reaching about 60 cm in diameter; crown is narrow, open and conical; roots shallow and widely spreading.

Bark: Young bark is grey, thin and smooth becoming scaly and reddish brown; inner bark is dark reddish purple.

Twigs/Buds: Twigs orangey brown and hairless, slender and flexible; buds dark red, small, rounded and smooth.

Leaves: Spirally attached and single on elongate twigs and in clusters of ten to 20 on the short spur twigs; stalkless; blade triangular in cross section, 2 to 3 cm long, soft and flexible; margins entire; turn golden yellow in the autumn when they are all shed.

Cones: Male cones tiny, short lived, on same tree with female cones; spring. Mature female cones light brown, roundish, 1 to 2 cm long with smooth rounded scales; upright, maturing and opening in the autumn but remaining on the tree until the following summer.

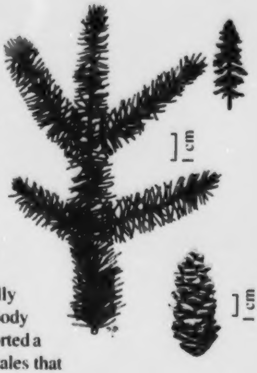
Habitat: Occurs on moist soils, and in poorly drained peatlands; it is shade intolerant.

Notes: Natives used the roots to sew the edges of birch bark canoes and to weave baskets.

K. Baldwin, Canadian Forest Service

Picea glauca – White spruce

Pine Family (Pinaceae), Épinette blanche



General: Needle-leaved, evergreen, conifer, mainly to 24 m high but reaching 40 m; trunk with a definite taper, commonly to about 60 cm in diameter but reaching 120 cm; crown cone-shaped with spreading to slightly drooping branches extending to the base in open-grown or lightly shaded trees but lower branches shed in densely shaded stands; roots shallow, widespread and pliable.

Bark: Light greyish brown, thin becoming scaly with age.

Twigs/ Buds: Whitish grey to yellowish, usually hairless; older branchlets rough due to the woody peg-like projections, each of which once supported a leaf; buds with blunt tips and pointed outer scales that do not project beyond the bud tip.

Leaves: Spirally arranged around the twigs, single, stalkless, on short woody peg-like extensions of the twigs, with lower needles often tending to turn upwards; blade needle-like, with blunt ends, four-sided (squarish) in cross section, straight and stiff; about 2 cm long; green to dull bluish green with a whitish powdery waxy layer (bloom); margins entire; with a skunk or cat-like odor when crushed.

MNR Photo

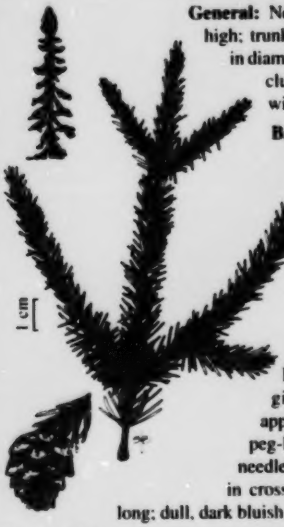
Cones: Male cones small, pale red, short-lived, on same tree as female cones; spring. Mature female cones cylindrical, drooping from ends of branches; 5 to 7 cm long, reddish to light brown, with smooth margined, rounded scales; open in the fall and drop from tree during autumn or winter.

Habitat: Prefers mineral soils on fresh to moist sites, occasionally on wet sites; frequently along riverbanks and commonly associated with black spruce, balsam fir, white birch and trembling aspen; rarely forms pure stands.

Notes: Commercially important for lumber and pulpwood.

Picea mariana – **Black spruce**

Pine Family (Pinaceae), Épinette noire



General: Needle-leaved, evergreen, conifer, to 30 m high; trunk straight with little taper, to about 26 cm in diameter; crown is narrow, often with a thickened club shape at the top and drooping branches with their ends turned up; roots shallow.

Bark: Dark greyish brown, thin, becoming scaly, with an olive green inner bark.

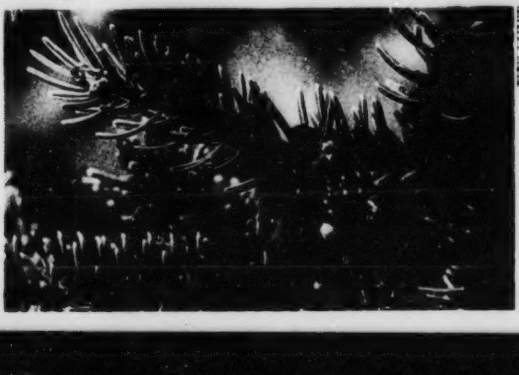
Twigs/Buds: Branchlets dark brown and densely covered with short rusty hairs; older branchlets rough due to the woody peg-like projections, each of which once supported a leaf; buds with finely hairy outer scales that have long slender points extending beyond the bud tip.

Leaves: Spirally attached around the twigs giving the leafy branchlet a cylindrical appearance, single, stalkless, on short woody peg-like projections from the branchlets; blade needle-like, with blunt ends, four-sided (squarish) in cross section, straight and stiff; 0.5 to 1.5 cm long; dull, dark bluish green; margins entire.

Cones: Male cones dark red, small, short-lived, on same tree as female cones; spring. Mature female cones egg-shaped, drooping from ends of branchlets; 2 to 3 cm long, purplish to dark brown, with rounded scales having a ragged outer edge. Seed cones mature in fall and release seeds gradually over several years; may be retained on the tree for many years.

Habitat: On a variety of dry to moist mineral soils on wet organic soils on shallow soils over bedrock. Reproduces vegetatively by layering; moderately shade tolerant.

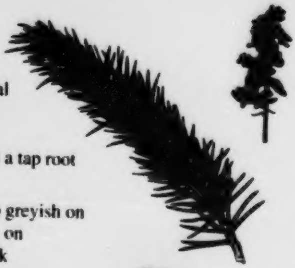
Notes: Distinguished from white spruce by the outer bud scales that are longer than the bud, the hairy twigs and smaller seed cones and scales that are ragged on the outer edge.



MNR Photo

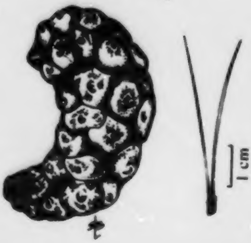
Pinus banksiana – Jack pine

Pine Family (Pinaceae), Pin gris



General: Needle-leaved, evergreen conifer, to 24 m high; trunk slender, straight, with little taper, to about 60 cm in diameter; crown highly variable, mainly conical and open with upwardly-spreading branches; roots moderately deep, widespreading and generally without a tap root except on deep porous soils.

Bark: Ranges from reddish brown to greyish on young stems to dark brown and flaky on older; older trunks with irregular thick plates.



Twigs/Buds: Yellowish green, slender, becoming dark greyish brown; buds pale reddish brown and rounded.

Leaves: Spirally attached in paired clusters, with papery sheath at base; blades straight to slightly curved or twisted, each pair spreading, sharp-pointed, yellowish green, stiff; 2 to 4 cm long; margins minutely toothed (use hand lens).

Cones: Male cones yellowish, 1 cm long, short-lived, clustered at the ends of branches on same trees as female cones; spring. Mature female cones curved or twisted, often in pairs; 2.5 to 8 cm long; yellowish brown; generally remaining tightly closed and requiring elevated temperatures for opening and release of the winged seeds; some normally opening cones are also produced.

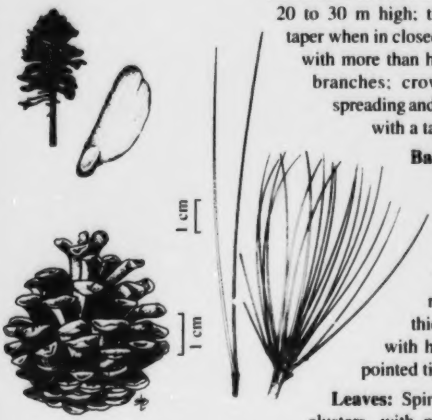
Habitat: On shallow soils, bedrock, dry to fresh, sandy to coarse loamy soils, rarely on moist or fine soils, shade intolerant. Forms pure or mixed stands.

Notes: Has serotinus cones that depend on elevated temperatures of about 50°C or fire to promote cone scale opening.

MNR Photo

Pinus resinosa – ***Red pine***

Pine Family (Pinaceae), Pin rouge



General: Needle-leaved, evergreen, conifer, 20 to 30 m high; trunk mainly with little taper when in closed stands, and commonly with more than half of its length free of branches; crown oval; roots wide-spreading and moderately deep, rarely with a tap root.

Bark: Reddish and scaly, eventually becoming furrowed or grooved and resinous with long ridges on older trunks.

Twigs/Buds: Orange to reddish brown, shiny and thick; buds reddish brown with hairy scales and sharply pointed tips.

Leaves: Spirally attached in paired clusters, with papery sheaths at base; blade long, needle-like, flattened on inside of cluster and rounded on outside, straight, flexible and sharp-pointed; 10 to 15 cm long; dark green and shiny; margins minutely toothed (use hand lens).

Cones: Male cones small, on same tree with female cones, short-lived; spring. Mature female cones ovoid, 3 to 7 cm long, greyish brown, with slightly thickened scales with prickles; winged seeds mature and are shed during the winter and summer of the second year. Cones may remain on the tree for several years after seed shed.

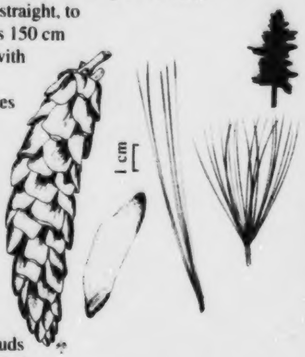
Habitat: On sandy to coarse loamy soils, usually on dry to fresh, well-drained sites; forms pure or mixed stands with conifers and hardwoods.

Notes: The common name is derived from the red color of the bark.

MNR Photo

Pinus strobus – White pine

Pine Family (Pinaceae), Pin blanc



General: Needle-leaved, evergreen conifer, commonly 30 to 40 m high, or to 50 m in favored sites; trunk straight, to about 100 cm in diameter or as much as 150 cm in exceptional cases; crown columner with widespreading horizontal branches in middle and upwardly ascending branches in top portion of crown; roots moderately deep, widespreading and without a tap root.

Bark: grey green and smooth when young, darkening with age; older trunks dark grey brown and deeply furrowed longitudinally with broad scaly ridges.

Twigs/Buds: Green and downy hairy, becoming hairless and orange brown; buds reddish brown, slender and sharply pointed.

Leaves: Spirally attached in clusters of five, papery sheaths at base falling off early; blades straight, sharp-pointed, bluish green, flexible and soft; 7 to 13 cm long; margins minutely toothed (use hand lens).

Cones: Male cones small, on same tree with female cones, short-lived; spring. Mature female cones curved, cylindrical drooping on short stalk; 8 to 20 cm long; greyish brown; scales smooth and thin without prickle; cones ripening in September and drooping once seeds are released.

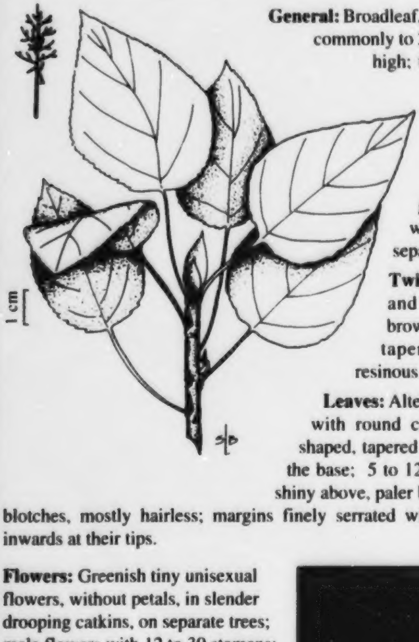
Habitat: On different soil types from dry sandy and shallow rocky sites to sphagnum bogs but grows best on fresh sandy or loamy soils; forms pure stands or mixed with conifers and hardwoods.

Notes: Highly prized as softwood lumber which is used widely for cabinetry, doors, windows and millwork and numerous other products. The large, tall straight trunks, squared to fit into the holds of sailing ships, were the choice timber for the British Admiralty for masts and construction timber during the 1800s.

MNR Photo

Populus balsamifera ssp. balsamifera – ***Balsam poplar***

Willow Family (Salicaceae), Peuplier baumier



General: Broadleaf, deciduous, flowering tree, commonly to 25 m, occasionally to 30 m high; trunk straight, cylindrical; crown narrow of ascending branches; roots shallow.

Bark: Greenish brown and smooth becoming grey and deeply furrowed with V-shaped crevices separating flat-topped ridges.

Twigs/Buds: Reddish brown and smooth; buds reddish brown, slender, elongate and tapered to a sharp point, resinous and fragrant.

Leaves: Alternate, simple, long-stalked with round cross section; blade egg-shaped, tapered to a point and rounded at the base; 5 to 12 cm long; dark green and shiny above, paler below with brownish resin blotches, mostly hairless; margins finely serrated with rounded teeth turning inwards at their tips.

Flowers: Greenish tiny unisexual flowers, without petals, in slender drooping catkins, on separate trees; male flowers with 12 to 30 stamens; female flowers with two stigmas; catkin scales undivided, with long hairy fringe; wind pollinated in spring before the leaves appear.

Fruit: Egg-shaped greenish capsule on short stalk, 5 to 8 mm long, with numerous minute seeds covered with a mass of long cottony hairs; spring to early summer.

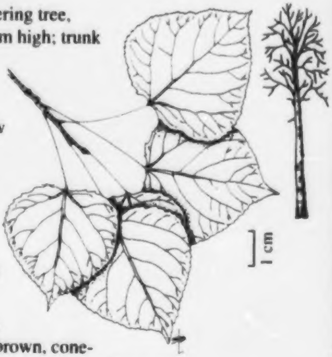
Habitat: On moist, rich soils, often in seepage areas or floodplains.

Notes: Wood is used for plywood and pulpwood; pieces of lower bark can be used as floats for fishing nets and lines.

B. Livingstone,CDA Museum of Nature

Populus tremuloides – Trembling aspen

Willow Family (Salicaceae), Peuplier faux-tremble



General: Broadleaf, deciduous, flowering tree, generally to 20 m, occasionally to 28 m high; trunk slender, cylindrical and branch-free for most of its length in forest sites, generally to 25 cm in diameter but may reach 60 cm; crown short, narrow and rounded; roots shallow, widespreading and producing new shoots from root suckers.

Bark: Pale greenish to whitish, smooth and waxy in appearance, becoming grey and furrowed with flat ridges with age.

Twigs/Buds: Greyish brown, slender, smooth and shiny; buds dark reddish brown, cone-shaped with a sharp point, hairless, without resin or fragrance.

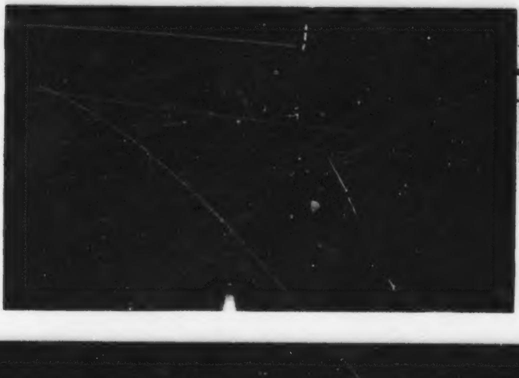
Leaves: Alternate, simple, with long flattened stalks usually longer than blade; blade widely egg-shaped to roundish with a pointed tip and a flat to rounded or slightly heart-shaped base; 2 to 8 cm long; deep green above paler below, hairless; margins finely round-toothed.

Flowers: Greenish tiny unisexual flowers, without petals, in slender drooping catkins, on separate trees; male flowers with five to 12 stamens; female flowers with four stigmas; catkin scales cleft into three to five long-fringed lobes; wind pollinated in spring before the leaves appear.

Fruit: Female catkins bear cone-shaped greenish capsules on short stalks; 5 to 9 mm long, with numerous minute seeds covered with a mass of long cottony hairs; spring to early summer.

Habitat: On a variety of fresh to moist soils; best stands are usually on well-drained sites.

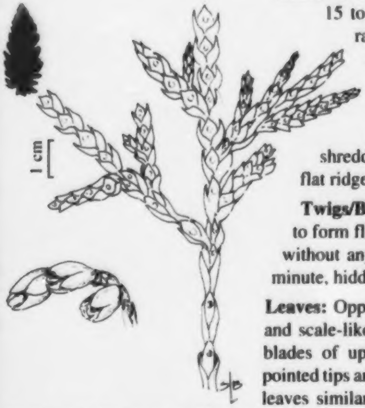
Notes: The common name is in reference to the leaf movement caused by the slightest breeze, the result of the flattened and flexible leaf stalk.



MNR, Algonquin Park

Thuja occidentalis – ***White cedar***

Cypress Family (Cupressaceae), Arbor Vitae, Thuya occidental



General: Scale-leaved, evergreen, conifer, 15 to 20 m high; trunk often twisted, rapidly tapering from a broadened and swollen base; crown narrow and conical; roots shallow and widespread.

Bark: Reddish brown and thin, shredding in long narrow strips forming flat ridges on old trunks.

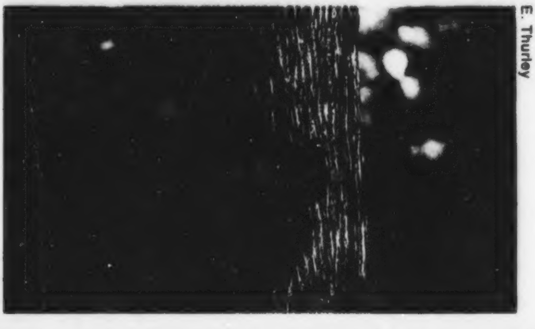
Twigs/Buds: Yellowish green, branching to form flattened sprays of leafy branchlets without any stem showing; buds green and minute, hidden under the scale leaves.

Leaves: Opposite, in alternate pairs, stalkless and scale-like with bases fused to branchlets; blades of upper and lower leaves flat with pointed tips and a yellowish glandular spot; side leaves similar but folded lengthwise covering the bases of the upper and lower leaves; older leaves becoming dark green above, yellowish green below, smooth; 2 to 4 mm long; margins entire.

Cones: Male cones minute, singly at the tips of branchlets, short-lived but the opened scales remaining visible as dried brownish tips of branchlets; on same tree but different branchlets from female cones; early spring. Mature female cones egg-shaped to oblong elliptic, 8 to 13 mm long, cinnamon brown with four to six pairs of scales. The winged seeds are released in the fall with the opened cones remaining on the tree for several years.

Habitat: On organic or mineral soils on moist to wet sites. Commonly on shallow moist soils over bedrock, on rich organic soils, or on riverbanks and lakeshores.

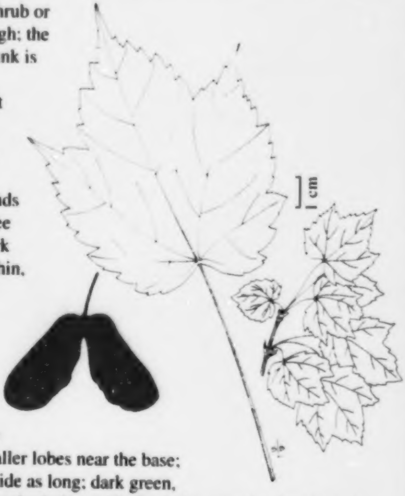
Notes: The wood is soft, light and decay resistant. It is commonly used for fence posts, shingles, and for boat and canoe building; it is also an important winter browse for deer.



E. Thurley

Acer spicatum – **Mountain maple**

Maple Family (Aceraceae), Érable à épis



General: Deciduous tall shrub or small bushy tree, to 5 m high; the short and often crooked trunk is divided into a few fairly straight and slender upright branches.

Branchlets: Purplish grey and minutely hairy with a dull velvety appearance; buds slender, stalked, two to three times longer than wide; bark reddish to greyish brown, thin, pale and flaky or slightly grooved.

Leaves: Opposite, stalks reddish tinged and as long or longer than blade, simple; blade with three prominent lobes tapering to a point and usually two smaller lobes near the base; 5 to 12 cm long, about as wide as long; dark green, smooth and hairless above, paler below with fine hairs; margin sharply and coarsely toothed.

MNR Photo

Flowers: Greenish yellow, both unisexual and perfect flowers on same plant; five narrow non-showy petals; flowers small, about 6 mm across, on slender branched stalks from the central axis of dense upright clusters borne at the ends of branchlets; late May to early July.

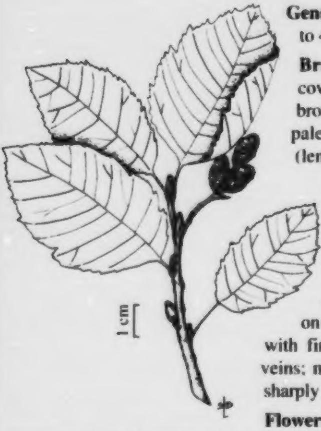
Fruit: A pair of stalked reddish tinged keys (samaras), each about 2 cm long on upright clusters; July to August.

Habitat: On rich, fresh to wet soils in a variety of forest types and in swamps; a common understorey species.

Notes: Important food source for moose and deer.

Alnus incana ssp. rugosa – ***Speckled alder***

Birch Family (Betulaceae), Aulne rugueux



General: Deciduous, coarse spreading shrub to 4 m high.

Branchlets: Light reddish brown and covered with fine soft hairs becoming dark brown to purplish black and hairless with pale corky horizontal lines or speckles (lenticels); buds reddish brown with blunt tips; pith is triangular in cross section.

Leaves: Alternate, stalked, simple; blade egg-shaped to oval, with tips pointed, base rounded or heart-shaped; 6 to 10 cm long; dark green, smooth, dull and commonly wrinkled on the surface, greenish to whitish below with fine hairs along the prominent straight veins; margins double-toothed and wavy with sharply and finely serrated edges.

Flowers: Drab, tiny, unisexual; male flowers aggregated into brownish elongate stalked catkins, 1 to 2.5 cm long, formed in late summer and lengthening the following spring to 8 cm long; female catkins forming in late summer, smaller than the male and remaining closed until the following spring in April to May when wind pollination takes place.

Fruit: Female catkins develop into rounded stalkless or short-stalked greenish cone-like catkins, about 1 cm long, with tiny wingless nutlets developing at the base of the persistent scales; nutlets are released in the fall. The brownish dry "cones" remain on the branches for one or more years.

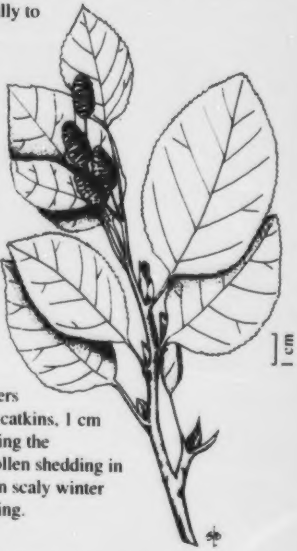
Habitat: Common on organic soils along streams, lakes and swamps associated with seepage. It is the most abundant shrub in the Clay Belt.

Notes: The inner bark was once used to make a yellow to reddish dye. Nodules of nitrogen fixing bacteria found on the roots help supplement soil nutrients.

MNR Photo

Alnus viridis ssp. crispa – **Green alder**

Birch Family (Betulaceae), Aulne crispé

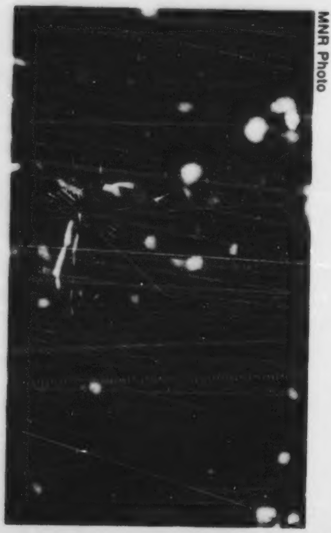


General: Deciduous coarse shrub, generally to about 3 m or more high.

Branchlets: Brownish, hairy and sticky, with pale corky spots or horizontal lines becoming reddish brown to grey and hairless; buds brownish with pointed tips; pith is triangular in cross section.

Leaves: Alternate, stalked, simple; blade roundish-oval to egg-shaped, with tip pointed or blunt and base rounded or slightly heart-shaped; 4 to 9 cm long; bright green surface, paler below, and sticky when young; margins somewhat wavy and curled (crisped) and edged with numerous fine, single-toothed, sharp teeth.

Flowers: Drab, tiny, unisexual; male flowers aggregated into brownish elongate stalked catkins, 1 cm long, formed in late summer and lengthening the following spring to 8 cm long at time of pollen shedding in May to June; female catkins forming within scaly winter buds and appearing in small clusters in spring.


MNR Photo

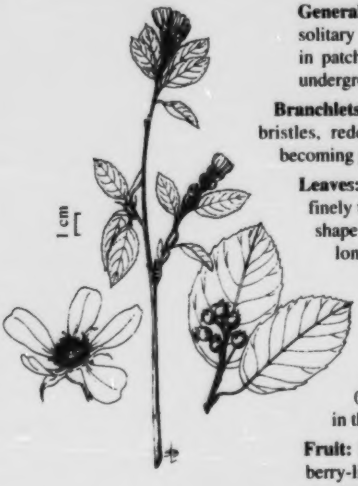
Fruit: After pollination, the female catkins develop into long-stalked, greenish cone-like structures, 1 to 2 cm long; the tiny winged nutlets form at the base of the persistent scales; nutlets are released in the fall. The brownish dry "cones" remain on the branches for one or more years.

Habitat: On sandy to coarse loamy or rocky soils, and gravelly shores on dry to fresh sites.

Notes: Can be distinguished from speckled alder by its uniformly serrated margin of fine teeth compared to the coarser double-toothed margins, its sharp-pointed buds compared to the rounded buds of speckled alder and its long-stalked verses stalkless cones.

Amelanchier spp. – ***Serviceberries***

Rose Family (Rosaceae), Amélanchier (Petites poires)



General: Deciduous, much-branched or solitary stemmed shrubs, often growing in patches (colonies) and spreading by underground basal branches (stolons).

Branchlets: Slender and without thorns or bristles, reddish or purplish when young, becoming gray with age, hairy or hairless.

Leaves: Alternate, stalked, simple, with finely to coarsely toothed margins, leaf shape variable and usually under 8 cm long and 4.5 cm wide, hairy or hairless.

Flowers: White, perfect, 5 petals, numerous stamens which are shorter than the petals; often in showy clusters (racemes), among the first to open in the spring; May and June.

Fruit: Round, reddish-purple to black, berry-like pome, edible, sweet in many species but dry and insipid in others, 5 to 10 seeds.

Habitat: Variable, many species prefer dry or rocky woodlands, however, there are species which may grow in wet woods and along stream banks. Not tolerant of deep shade.

Notes: Serviceberries are known by many common names: shadbush, juneberry, shadblow, Saskatoon berry and sugarplum. The taxonomy for this family is very complicated and continuously changing. If attempting to identify to the species level you are well advised to check several representative leaves or fruits before making your decision Hybridization is very common between species. Some species can be small trees.

Rob Arnup, ESG International

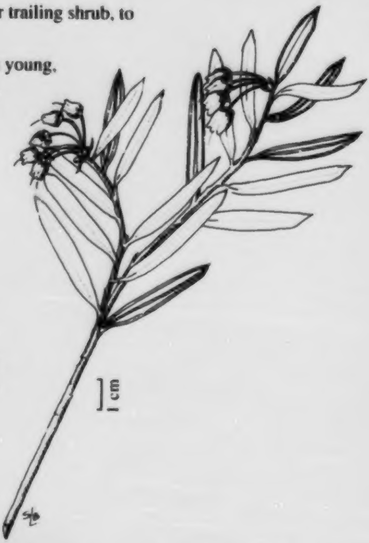
Andromeda polifolia ssp. glaucophylla – Bog rosemary

Heath Family (Ericaceae), Andromède glauque

General: Evergreen, erect or trailing shrub, to 60 cm high.

Branchlets: Brownish when young, grey to blackish when older, hairless, few in number and rounded in cross section.

Leaves: Alternate, short-stalked, simple; blades narrowly oblong with tip ending in a tiny sharp spine, base tapered; 2 to 5.5 cm long; bluish green to dark green above, leathery and firm, whitened below with a short layer of white hairs; margins entire and conspicuously curled under.



MNR Photo

Flowers: White to pink; perfect; urn-shaped with five short recurved lobes; 5 to 6 mm long, on elongate flower stems drooping in terminal clusters from branch tips; May to June.

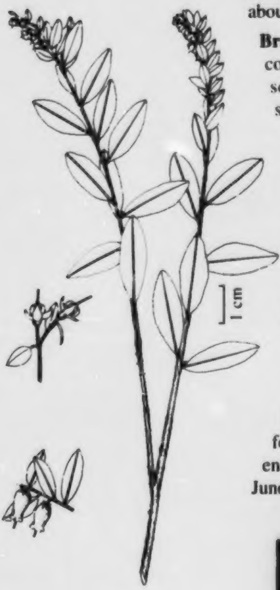
Fruit: Roundish capsule at first bluish then turning brown, about 6 mm in diameter, containing numerous seeds; July to August.

Habitat: On organic soils in wet sites, especially in sphagnum bogs and in poor black spruce and tamarack forests.

Notes: This species may be confused with pale laurel (*Kalmia polifolia*) but it differs in having flattened stems and opposite leaves.

Chamaedaphne calyculata – Leatherleaf

Heath Family (Ericaceae), Cassandre caliculé



General: Evergreen, much-branched shrub, to about 1 m high, often forming dense thickets.

Branchlets: Brownish, minutely hairy, and covered with small, round, flat and flaky scales, older stems grayish with bark shredding revealing a reddish inner bark.

Leaves: Alternate, short-stalked, simple; blade oblong to elliptic, becoming progressively smaller towards the tip of the flowering branches, tip blunt or abruptly pointed, base rounded or tapered; 1 to 4.5 cm long; dull green to brownish and hairless above, pale brownish below with a dense covering of rounded, flat rusty scales, leathery; margins entire or with minute, rounded teeth.

Flowers: White, urn or bell-shaped, five-parted, 5 to 6 mm long, pendent and forming a one-sided elongate cluster at the ends of the spreading branches; May to early June.

Fruit: Roundish brown capsule, to 6 mm in diameter, containing numerous minute seeds; style persistent on the developing capsules that remain on the branches for several years; maturing July to August.

Habitat: On peaty, acidic, organic soils in poor treed peatlands, bogs, flooded wetlands and along streams and lakeshores.

Notes: Because of its thicket-forming habit along suitable bodies of water, leatherleaf can be instrumental in the development of floating mats leading to bog formation.

MNR Photo

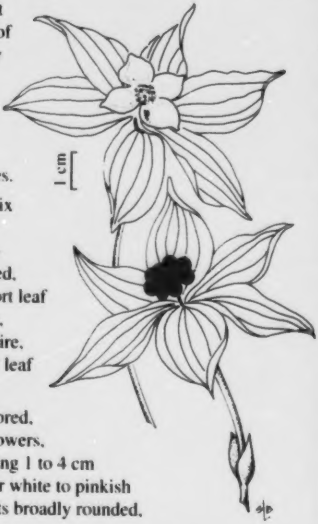
Cornus canadensis – **Bunchberry**

Dogwood Family (Cornaceae), Cornouillier du Canada

General: Deciduous low shrub to about 20 cm high; stems, topped by a cluster of whorl-like leaves, arising from a woody rootstock.

Branchlets: Greenish, smooth and non-woody, slightly ridged or striate and with one to two pairs of leaf-like scales on the stem below the main leaves.

Leaves: In a terminal whorl of four to six leaves, sometimes with a second whorl below; short-stalked, simple; blade egg-shaped to elliptic or inversely egg-shaped, tapering to a point at the tip and to a short leaf stalk at base; 2 to 9 cm long; dark green, smooth above, paler below; margins entire, veins prominent and curved towards the leaf tip.

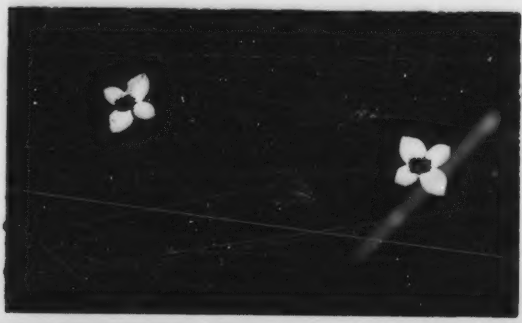


Flowers: Yellowish green to cream-colored, consisting of tiny, four-parted perfect flowers, clustered on a main flower stalk projecting 1 to 4 cm above the leaf whorl, surrounded by four white to pinkish petal-like modified leaves (bracts); bracts broadly rounded, 1 to 2 cm long; June to July.

Fruit: Bright red cluster of rounded berry-like fruit, each 5 to 8 mm in diameter; July to September.

Habitat: On a variety of soils and moisture conditions; common on hummocks, rotten stumps and logs; tending to form dense patches in better-drained conifer, deciduous and mixed forest habitats.

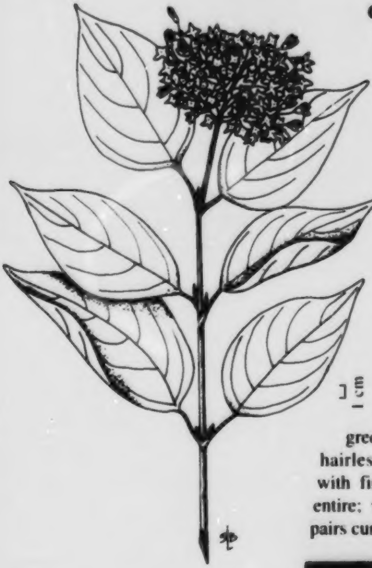
Notes: One of the most common forest understorey plants.



Doug Skeggs, MNR

Cornus stolonifera – *Red osier dogwood*

Dogwood Family (Cornaceae), Cornouiller stolonifère



General: Deciduous erect to loosely spreading, to 3 m high; branches at times downwardy bent and rooting where they touch the ground and forming thickets because of their vegetative spread by runners (stolons).

Branchlets: Greenish and finely hairy becoming bright red or purplish and smooth with age; pith in centre of stems white and large.

Leaves: Opposite, stalked, simple; blade egg or lance-shaped, tapering to a short point at tip and rounded or narrowed at base; 5 to 15 cm long; dark green upper surface is smooth and hairless to slightly hairy, whitened with fine soft hairs beneath; margins entire; veins prominent, five to seven pairs curving towards leaf tip.

Flowers: Creamy white, perfect; four-parted and small, in slightly rounded or flat-topped branched clusters from the ends of branches; late June.

Fruit: Rounded white or bluish berry-like drupe, about 6 mm in diameter, with a single stone; August to September.

Habitat: Usually in moist to wet areas forming thickets in meadows, along shores, roadside ditches and clearings in wet black spruce forests.

Notes: The fruit are a food source for songbirds, squirrels and grouse, and the twigs are winter browse for moose, deer and snowshoe hares.

MNR Photo

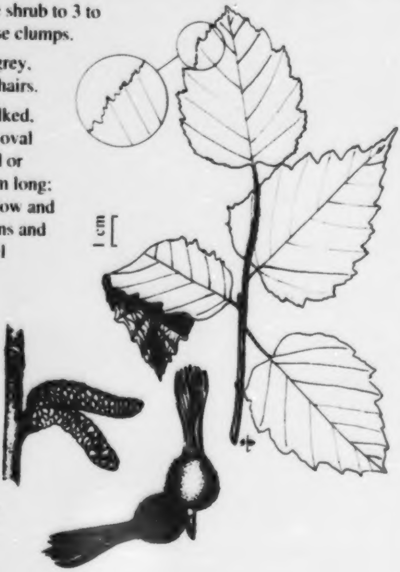
Corylus cornuta ssp. cornuta – **Beaked hazel**

Birch Family (Betulaceae), Noisetier à long bec

General: Deciduous, coarse shrub to 3 to 4 m high often forming dense clumps.

Branchlets: Pale brown to grey, smooth but with a few long hairs.

Leaves: Alternate, hairy-stalked, simple; blade egg-shaped to oval with pointed tip and rounded or heart-shaped base; 5 to 12 cm long; bright green above, paler below and hairy, particularly on the veins and in the vein angles, blades feel coarse to the touch; margins generally sharply double-toothed.

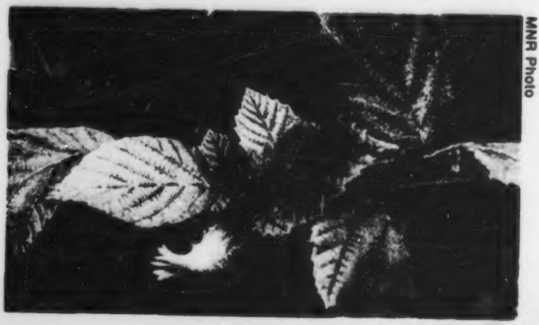


Flowers: Yellowish green, unisexual and tiny, with both kinds on the same plant. Male flowers in catkins to 5 cm long; opening April to May. Female flowers in tiny clusters mainly concealed by the bud scales but with the crimson styles protruding; receptive in April to May.

Fruit: Round, hard-shelled nut, about 12 mm long, enclosed in a bristly husk with an elongate tube-like beak, 3 to 4 cm long, open at the fringed end; ripen August to September.

Habitat: On rich woodland soils in dry to moist areas, in clearings and along the forest edges in hardwoods and mixed forest stands.

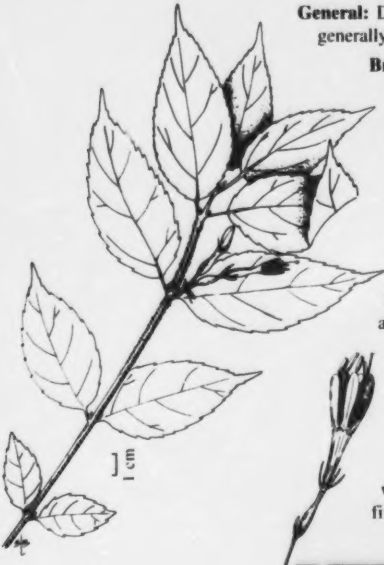
Notes: Nuts are sweet and edible.



MNR Photo

Diervilla lonicera – Bush honeysuckle

Honeysuckle Family (Caprifoliaceae), Dièreville chèvrefeuille



General: Deciduous, low upright shrub, generally under 1 m high.

Branchlets: Green to reddish, commonly with fine hairs along two low ridges running lengthwise along the stem; older stems grey to brownish.

Leaves: Opposite, short stalked, simple; blade egg-shaped to oblong, tapering to a long and at times curved tip, with rounded base; 5 to 13 cm long; dark green and smooth above or hairy on the midrib, paler below and generally with dense, short hairs; margins sharply toothed and fringed with short hairs.

Flowers: Yellow, turning orange or brownish red with age, perfect, tubular with five lobes; tubes to about 2 cm long; in clusters of two to seven at branch tips or from leaf axils; June to July.

Fruit: Slender brown capsule, 10 to 15 mm long, including the slender beak; contains numerous seeds; July to September.

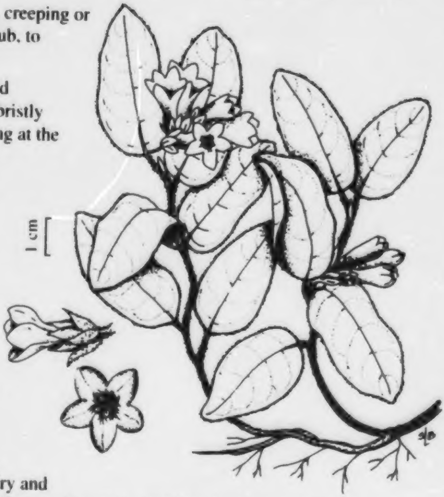
Habitat: On sandy and rocky soil in dry open woodland sites, cliffs, river banks and open pastures. A common understorey plant in poplar and jack pine stands.

Notes: Sharply toothed egg-shaped leaves with pointed tips distinguish this species from the northern honeysuckle (*Lonicera villosa*) that lacks teeth and has oblong leaves with rounded tips.

MNR Photo

Epigaea repens – ***Trailing arbutus***

Heath Family (Ericaceae), Épigée rampante



General: Evergreen, creeping or trailing branched shrub, to about 40 cm long.

Branchlets: Wiry and covered with brown bristly hairs; regularly rooting at the nodes (points of leaf attachment).

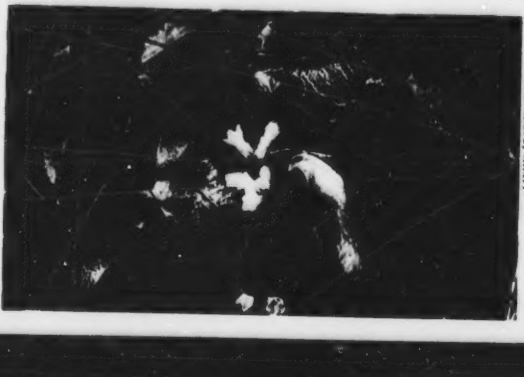
Leaves: Alternate, stalks with brown hair, simple; blade oval to broadly elliptic with rounded to small-pointed tip, base rounded or heart-shaped; to 7 cm long; drab green, leathery texture, upper surface, mostly hairless, underside hairy and with a prominent midrib; margin entire and fringed with brownish hairs.

Flowers: White to pink and fragrant, perfect or unisexual; funnel-shaped and waxy with five spreading lobes; 8 to 15 mm long; in few-flowered clusters at branch tips or from leafstalk angles; April to May.

Fruit: Round brownish capsule with a persistent narrow style; about 1 cm in diameter and containing numerous minute brown seeds; late summer.

Habitat: On sandy to coarse loamy and acidic soils in dry to fresh sites particularly under conifers.

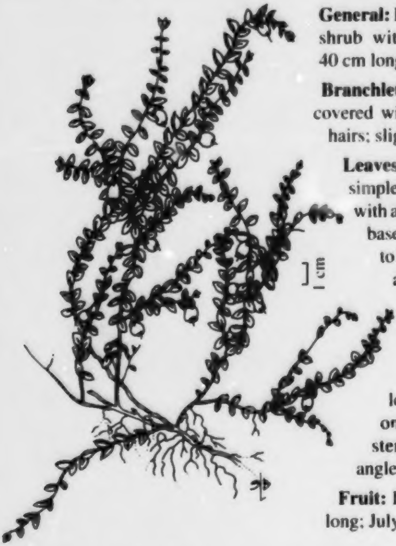
Notes: The provincial flower of Nova Scotia.



Brenda Chambers, MNR

Gaultheria hispidula – ***Creeping snowberry***

Heath Family (Ericaceae), Gaulthérie hispide



General: Evergreen trailing or creeping shrub with slender matted stems to 40 cm long.

Branchlets: Brownish, delicate stems covered with closely pressed brownish hairs; slightly woody.

Leaves: Alternate, minutely stalked, simple; blade egg-shaped to elliptic with a short pointed tip and rounded base; 2 to 10 mm long; dark green to brownish, firm, smooth above and paler below with bristly brown hairs; margins smooth and curled downwards.

Flowers: White, perfect, bell-shaped with four lobes; 2 to 3 mm long; solitary, on short downwardly curved stems arising in the leafstalk angles; May to June.

Fruit: Rounded white berry, 10 mm long; July to August.

Habitat: On decaying logs and stumps in moist coniferous forests and in wet peatlands.

Notes: The genus commemorates a court physician and botanist in Quebec, Jean-François Gaultier, 1708 to 1756. Tic Tac candies take their look and taste from this species.

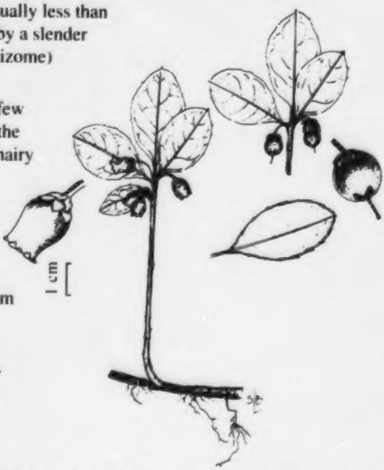
MNR Photo

Gaultheria procumbens – *Wintergreen*

Heath Family (Ericaceae), Gaulthérie couchée (Thé des bois)

General: Evergreen, low (usually less than 15 cm tall), erect, spreading by a slender woody underground stem (rhizome) across the forest floor.

Branchlets: Slender, with a few reddish bracts or scales near the bottom, greenish to reddish, hairy in the upper part, hairless below; leaves clustered near the ends of the branches.



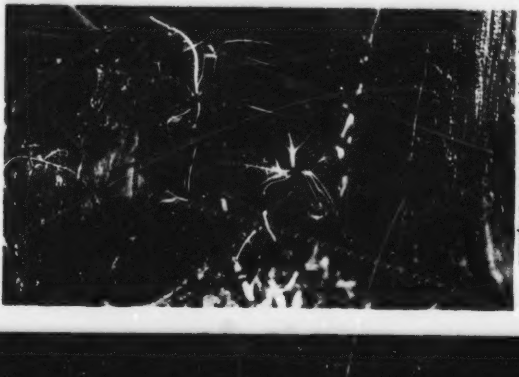
Leaves: Alternate, simple, with short hairy, often red leaf stalks (2 to 5 mm long), blades oval or oblong 1 to 5 cm long, tender when young, leathery when mature, dark, hairless (except for midvein on top of the leaf which is usually short hairy), shiny, dark green above and paler below, margins rolled slightly under with irregular incurved, bristle-tipped teeth; leaf tip often has a short projection, while the base narrows to the leaf stalk.

Flowers: White, perfect, urn shaped, 5 to 9 mm long with five rounded lobes, solitary on nodding, curved flower stalks arising from the axil of the leaves; June and July.

Fruit: Round, bright red, dry, berry-like capsule, 10 mm in diameter, often remaining on the plant over the winter; August and September.

Habitat: Sandy, dry or mossy woods, often does well after a fire.

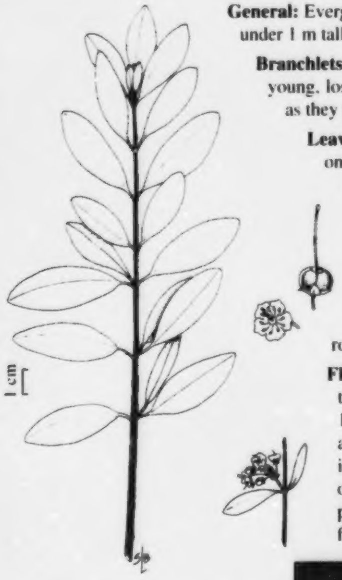
Notes: Flavored with wintergreen in all parts and aromatic when bruised.



Wendy Copps, Blue Heron Graphics

Kalmia angustifolia – *Sheep laurel*

Heath Family (Ericaceae), Kalmia à feuilles étroites (Crevard de moutons)



General: Evergreen, many-branched shrub usually under 1 m tall.

Branchlets: Brown and slightly downy when young, losing the down and becoming grayer as they age, woody, round.

Leaves: Opposite or in whorls of three, on short leaf stalks which are minutely hairy (3 to 10 mm long), simple, 3 to 5 cm long, 5 to 20 mm wide, oval or elliptic, blunt or rounded tip, base tapering to the leaf stalk, firm, dark green above, green beneath and almost hairless on both sides, margins entire and sometimes rolling under slightly.

Flowers: Pink to almost purple as they age, perfect, saucer-shaped, 9 to 12 mm in diameter; stamens arched and held in small pouches on the inside of the flower when it first opens, stamens later released from the pouch by an insect landing on the flower, which is sprayed with pollen from the stamen; in short stalked clusters from the axils of the previous year's leaves such that the present year's leaves are over the flower; June and July.

Fruit: Clusters of nearly spherical brown capsules up to 6 mm in diameter containing many small seeds; the flower style may persist as long as the capsule which may stay on the plant for several years; July and August.

Habitat: Variable; dry or moist woods, wetlands, sand plains, preferring acid soils.

Notes: The leaves of this species are poisonous to sheep resulting in its other common name, lambkill.

John E. Thompson, Ontario Parks

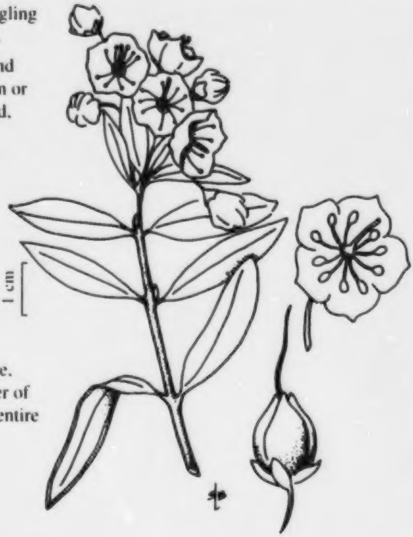
Kalmia polifolia – Pale laurel

Heath Family (Ericaceae), Kalmia à feuilles d'Andromède

General: Evergreen, straggling shrub to about 60 cm high.

Branchlets: Pale brown and hairless turning dark brown or blackish with age; flattened, with the two-edges alternating at right angles between the leaf bases.

Leaves: Opposite, stalkless, simple; blade narrowly oval to elliptic with blunt tip and base rounded or tapered; 1 to 4 cm long; dark green, shiny and leathery, hairless above, whitened with a dense layer of short hairs below; margin entire and curled downwards.



MNR Photo

Flowers: Pink, perfect, saucer-shaped with five shallow lobes; about 1 cm in diameter; on slender long stalks, in clusters at the ends of branches; May to June.

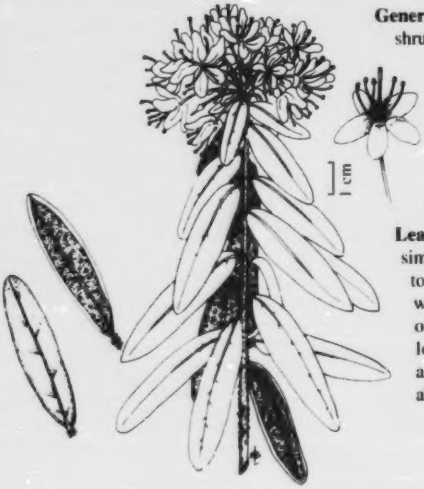
Fruit: Globular brown capsule, about 5 mm in diameter with a persistent slender style as long as the capsule; seeds numerous; in erect clusters; July to August.

Habitat: On organic soils in wet sites, particularly in poor black spruce dominated peatlands and in bogs.

Notes: A toxin present in this and in some other members of the family may poison humans and livestock if the plant is eaten.

Ledum groenlandicum – **Labrador-tea**

Heath Family (Ericaceae), Lédon du Groënland



General: Evergreen, spreading shrub to about 1 m high.

Branchlets: Densely covered with curled brown hairs when young, becoming hairless, greyish to reddish brown with age.

Leaves: Alternate, stalked, simple; blade narrowly oval to oblong or broadly linear with a blunt tip and rounded or tapered base; 2 to 5 cm long; dark green, thick and leathery, hairless above, covered by whitish or generally by a woolly layer of rusty curly hairs; margins entire, rolled downwards; fragrant when crushed.

Flowers: White, perfect, five-parted; about 1 cm in diameter; on slender curved stalks forming dense rounded showy clusters at the ends of branches; May to June.

Fruit: Egg-shaped brownish capsule, 5 to 6 mm long, topped by a slender elongate style; opens by splitting from the base upwards into five segments releasing numerous tiny seeds; July to August; empty capsules persist for several years.

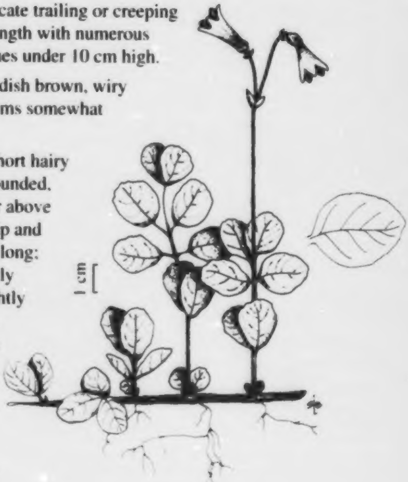
Habitat: On nutrient-poor, dry to wet soils, especially common in poor black spruce peatland sites.

Notes: Widespread and common across Canada.

Erich Haber, National Botanical Services

Linnaea borealis ssp. longiflora – Twinflower

Honeysuckle Family (Caprifoliaceae), Linnée boréale



General: Evergreen, delicate trailing or creeping vine, to 2 m or more in length with numerous short upright leafy branches under 10 cm high.

Branchlets: Green to reddish brown, wiry and finely hairy, older stems somewhat woody.

Leaves: Opposite, with short hairy leafstalk, simple; blade rounded, oval or egg-shaped, wider above the middle, with a blunt tip and narrowed base; 1 to 2 cm long; dull green with short bristly hairs on top; margins slightly rolled downwards, with a short fringe of hairs and a few blunt teeth above the middle.

Flowers: Pinkish white and fragrant, perfect, bell-shaped, hairy inside, five-lobed; 10 to 15 mm long; usually in pairs, one at each tip of a Y-shaped stalk, 5 to 10 cm long having two tiny much reduced leaves (bracts) at the fork; flower stalks glandular-hairy; June to August.

Fruit: Tiny brownish glandular-hairy capsule with a single seed, enclosed by the remains of the sepals; August to September

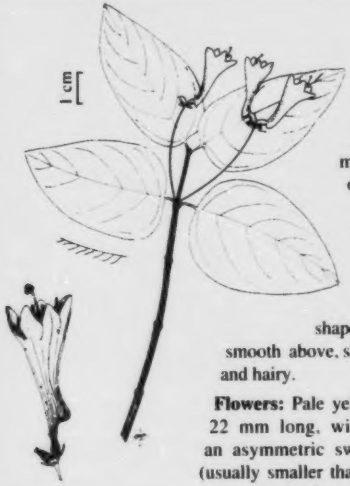
Habitat: On a wide variety of soil and sites in dry to wet forested habitats; hummocks in sphagnum bogs, mossy rotten logs, riverbanks and woodland edges in coniferous and mixed woodlands.

Notes: Named after himself by Carolus Linnaeus (1707 to 1778), Swedish physician and naturalist and founder of the modern system of naming plants and animals.

Brenda Chambers, MNR

Lonicera canadensis – **Canada honeysuckle**

Honeysuckle Family (Caprifoliaceae), Chèvrefeuille du Canada



General: Deciduous, straggling or loosely branched shrub up to 1.5 m in height.

Branchlets: Green or purplish and smooth when young, becoming gray or brown as they age, the bark may come off in threadlike pieces from older branches; pith white and solid.

Leaves: Opposite, on short hairy leaf stalk, simple, ovate-oblong to elliptic, 2.4 to 9.5 cm long, 2.5 to 5 cm wide, thin, blunt to pointed at tip, shallowly heart-shaped or tapered at the base, bright green, smooth above, slightly paler beneath, margins entire and hairy.

Flowers: Pale yellow, perfect, funnel-shaped, 12 to 22 mm long, with flaring lobes at the end and an asymmetric swelling at the base, small bracts (usually smaller than the ovary) lie at the base of the ovary; on slender stalks arising from the axils of the leaves, opening while the leaves are still expanding; May and June.

Fruit: Divergent pairs of oval, red, egg-shaped berries with 3 to 4 seeds on long slender stalks; June and July.

Habitat: Variable, dry or moist woods, occasionally around wetlands.

Notes: The hairs on the leaves and leaf stalk may be difficult to see when the leaves are young and may have worn off on older leaves.

Bill Crins, MNR

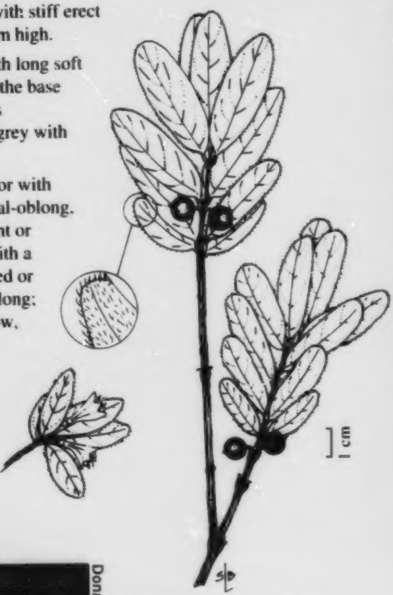
Lonicera villosa – Northern honeysuckle

Honeysuckle Family (Caprifoliaceae), Chèvrefeuille velu

General: Deciduous shrub with stiff erect branches, generally under 1 m high.

Branchlets: Purplish red with long soft scattered hairs, especially at the base of the leaf stalks; older twigs becoming reddish brown to grey with papery, peeling bark.

Leaves: Opposite, stemless or with short stalk, simple; blade oval-oblong, wider above the middle, blunt or rounded at tip, sometimes with a minute spine-like tip, rounded or tapered at base; 2.5 to 6 cm long; dark green above, paler below, firm, hairy on both sides, especially on the lower margins; margins entire, fringed with hair, sometimes with edge rolled under; leaves tend to be crowded towards the ends of the branches.



Donald R. Gunn, CDA Museum of Nature

Flowers: Yellowish perfect, funnel-shaped with five lobes; 10 to 15 mm long; in pairs on short hairy stalks from the leaf angles; May to June.

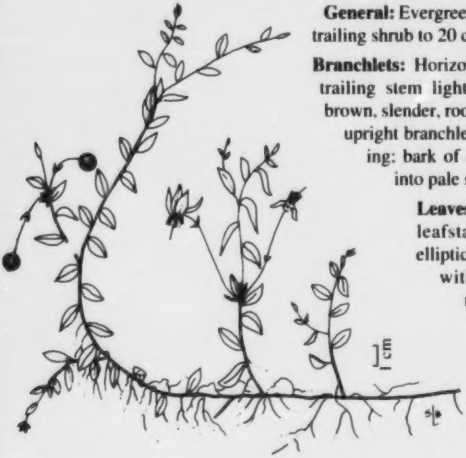
Fruit: Roundish blue berry-like, about 8 mm in diameter; July to August.

Habitat: In rocky or peaty soils in a variety of moist to wet sites in peatlands, along shorelines, and in clearings.

Notes: This honeysuckle is readily distinguished from the bush honeysuckle (*Diervilla lonicera*) that has sharply toothed egg-shaped leaves with pointed tips.

Oxycoccus microcarpus – **Small cranberry**

Heath Family (Ericaceae), Airelle canneberge



General: Evergreen, delicate, vine-like trailing shrub to 20 cm high.

Branchlets: Horizontally creeping and trailing stem light brown to reddish brown, slender, rooting at many points; upright branchlets leafy and flowering; bark of older stems peeling into pale shreds.

Leaves: Alternate, with tiny leafstalk, simple; blade elliptic to narrowly ovate, with pointed tip and rounded base; mainly under 1 cm long; dark green, shiny upper surface, whitened below by a waxy layer; margins entire and curled downwards.

Flowers: Pink, perfect, four-parted; petals, 5 to 6 mm long and characteristically backwardly-curved; pollen sacs project prominently; in small clusters of two to six on long slender stalks having two tiny scales at or below middle; late June and July.

Fruit: Rounded, pale red or pinkish speckled berry, 5 to 15 mm in diameter; August to September.

Habitat: Organic acidic soils of wet peatlands.

Notes: Differs from creeping snowberry (*Gaultheria hispidula*) in having long-stemmed flower stalks from upright shoots, red berries, and broader leaves with a waxy white lower surface lacking bristly brown hairs. The sour berries are edible.

MNR Photo

Ribes glandulosum – *Skunk currant*

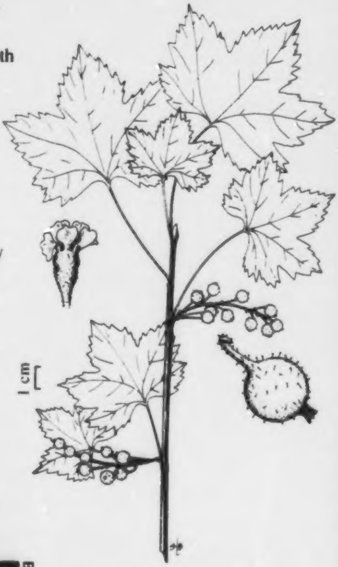
Saxifrage Family (Saxifragaceae), Gadellier glanduleux

General: Deciduous, low trailing or reclining to upward-growing shrub without prickles, under 1 m high, with a distinctive skunk-like odor when crushed.

Branchlets: Purplish grey, hairless or minutely hairy and somewhat angled or ridged, becoming smooth and blackish as the outer bark peels off.

Leaves: Alternate, stalks long, finely hairy with a few gland-tipped hairs on the expanded base, simple; blade maple-like with three to five, sometimes seven lobes with pointed tips, base deeply heart-shaped; 2 to 8 cm long; dark green and hairless above, paler with fine hairs below; margins coarsely double-toothed.

Flowers: Yellowish green to purple tinged, perfect, deep saucer-shaped, five-lobed; about 6 mm wide; several stalked flowers on an elongate, erect to arched, glandular-hairy flower stalk; June.



Brenda Chambers, MNR

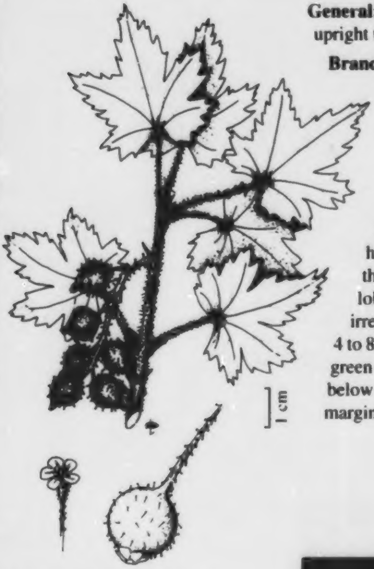
Fruit: Round, red, bristly-glandular berry, about 6 mm in diameter; unpleasant to the taste; July to August.

Habitat: On various moist soils in forest habitats, including streams, shores, and clearings in black spruce forest or in mixed forest stands.

Notes: The lack of sharp bristles on the branches, nearly glandless leafstalks and erect flower and fruiting clusters readily distinguish this species from bristly black currant with which it occurs commonly.

Ribes lacustre – ***Bristly black currant***

Saxifrage Family (Saxifragaceae), Gadellier lacustre



General: Deciduous, low shrub, with an upright to spreading form, to 1 m high.

Branchlets: Pale brown with minute hairs among the dense covering of sharp prickles, longer spines present at the bases of leaves; older bark becoming greyish and peeling.

Leaves: Alternate, long stalked with abundant glandular hairs, simple; blade maple-like with three or five pointed, deeply cut lobes, that are again somewhat irregularly cut, bases heart-shaped; 4 to 8 cm long and about as wide; dark green above and sparsely hairy, paler below with scattered glandular hairs; margins coarsely toothed.

Flowers: Yellowish green to purplish, perfect, deep saucer-shape, five-lobed; under 6 mm across; several stalked flowers in an elongate arched or drooping cluster, with dark, gland-tipped hairs on the stalks and main flower cluster stem; May to June.

Fruit: Round, purplish black berry with glandular hairs; 9 to 12 mm in diameter; unpleasant tasting; July to August.

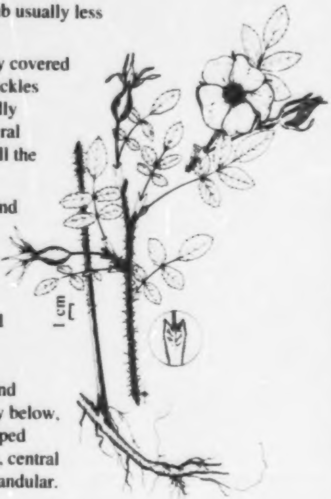
Habitat: Rocky soils, slopes, fresh to moist woods in shady to open sites, and in rich peatlands.

Notes: The bristly stems, spines at the bases of the glandular leafstalks and deeply lobed blades, and glandular berries are distinctive features.

Erich Haber, National Botanical Services

Rosa acicularis ssp. sayi – Bristly wild rose

Rose Family (Rosaceae), Rosier aciculaire



General: Deciduous, low bushy shrub usually less than 1 m tall, often suckering.

Branchlets: Reddish, usually densely covered with many slender, sharp, straight prickles 3 to 4 mm long, the prickles are usually abundant (numerous) on both the lateral (floral) branches and the main stalk all the way to the soil surface.

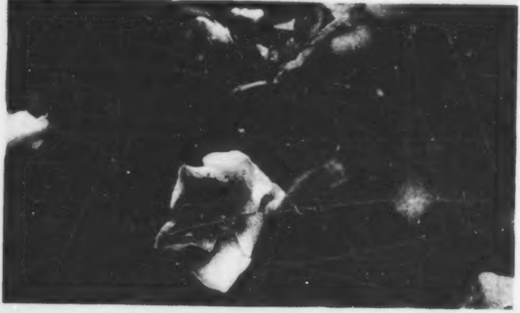
Leaves: Alternate, pinnately compound with 5 to 7 (rarely 9) leaflets; leaf stalks with large, hairy, usually glandular stipules (leaf-like appendage) at the base; leaflets thin oval to elliptic 2 to 5 cm long, pointed or blunt at the tip, blunt, rounded or heart-shaped at the base.
short stalked or stalkless, dull green and hairless above, paler and slightly hairy below, margins sharply toothed and gland tipped (fewer towards the base of the leaflet), central leaf stalk (rachis) hairy and usually glandular.

Flowers: Pink, perfect, petals 2 to 3 cm long and almost as wide, often solitary but occasionally in small clusters, sepals glandular and white, inside hairy; June to July.

Fruit: Spherical, ellipsoid or pear-shaped, smooth, red rosehip, 2 cm long, with many seeds, ripening in late summer or early fall.

Habitat: Variable, most soil types, dry to moist (not organic), clearings to open woodlands, lake shores and river banks.

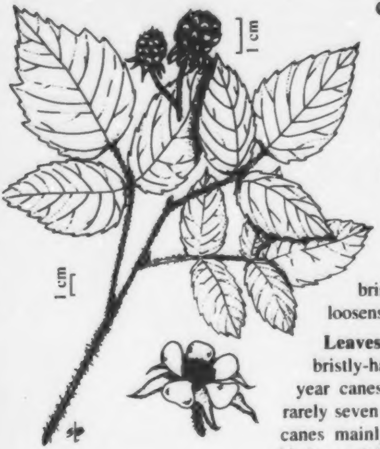
Notes: This species has the largest range of any species of the genus Rosa, being found circumpolarly, and is the only one of our wild rose species that is also found in Europe. This species varies greatly in hairiness, amount of glands and fruit shape.



MNR Photo

Rubus idaeus ssp. melanolasius – Wild red raspberry

Rose Family (Rosaceae), Ronce du Mont Ida



General: Deciduous, prickly shrub with upright arching stems lasting for two years (biennial), to 2 m high, spreading by runners (stolons).

Branchlets: First year stems generally unbranched, greenish to brown, densely bristly and with glandular hairs; second year stems with short branches, brownish and smoother, losing most of the bristles as the outer papery bark loosens and splits.

Leaves: Alternate, stalks long and bristly-hairy, compound, leaves of first year canes (stems) with three or five, rarely seven leaflets, those of second year canes mainly with three leaflets; leaflet blades variable in shape from egg-shaped to narrowly lance-shaped, tapering to sharp point and rounded at base; when five leaflets present, the middle pair closer to the terminal leaflet, 5 to 10 cm long; dark green hairless or lightly hairy above, grey to whitish hairy below; margins irregularly or double-toothed.

Flowers: White, perfect, with five petals; about 1 cm across; two to five, in small glandular-hairy clusters at ends of second year branches; June to July.

Fruit: Domed thimble-like head of reddish or amber fruitlets that drop from their central core intact; about 1 cm in diameter; July to August.

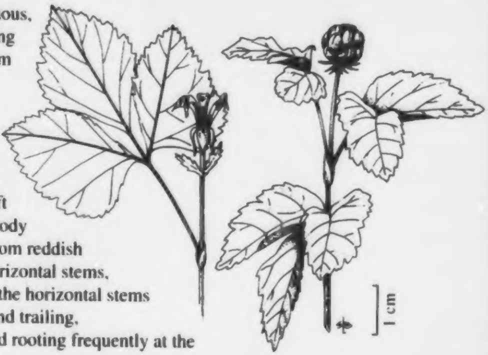
Habitat: On variable soils, in dry to moist open sites; disturbed ground, fields, roadsides, forest edges, clearings and burn sites. Not shade tolerant.

Notes: The fruit is an important food source for wildlife. This is a highly variable species. Also known by several other scientific names.

MNR, Algonquin Park

Rubus pubescens – **Dwarf raspberry**

Rose Family (Rosaceae), Ronce pubescente



General: Deciduous, trailing or creeping shrub, 10 to 30 cm high.

Branchlets: Upright flowering branchlets green with scattered soft hairs, slightly woody at base, arising from reddish brown slender horizontal stems, lacking prickles; the horizontal stems arching or long and trailing, non-flowering and rooting frequently at the branch points.

Leaves: Alternate, long-stalked, with scattered hairs, compound; blade usually three-parted, each leaflet egg-shaped or somewhat diamond-shaped, with pointed tips; end leaflet with wedge-shaped base, side leaflets tending to have rounded bases, at times with an additional lobe on the outside; leaflets short-stalked or stalkless, 2 to 7 cm long; green, surfaces mainly hairless; margins coarsely toothed.

Flowers: White to pale pink, perfect; five spreading petals, bud leaves (sepals) characteristically downwardly curved; 1 cm in diameter; singly or in loose clusters of one to three on slender glandular stalks; May to June.

Fruit: Rounded bright red thimble of edible fruitlets adhering tightly to the central core; 5 to 10 mm thick; July to September.

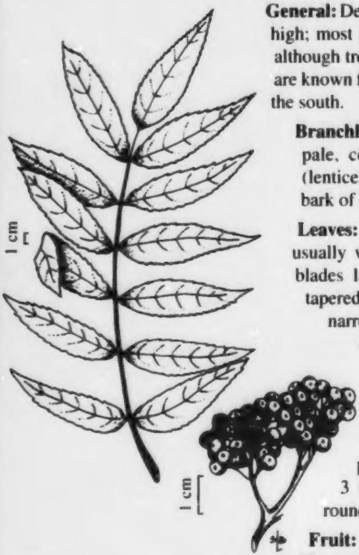
Habitat: Common in rich soils in fresh to moist sites; on hummocks in sphagnum bogs, stream banks, deciduous woodlands.

Notes: Readily distinguished from wild red raspberry (*Rubus idaeus* ssp. *melanolasius*) by its slender trailing form, lack of bristles and all leaves having only three leaflets.

B. Livingstone, CDA Museum of Nature

Sorbus americana – **American mountain ash**

Rose Family (Rosaceae), Sorbier d'Amérique



General: Deciduous shrub or small tree, to 10 m high; most plants tend to be shrubby in form although trees with a trunk diameter to 45 cm are known from regions of optimum growth to the south.

Branchlets: Greenish brown to reddish with pale, corky horizontally elongate areas (lenticels); older branches red brown and bark of trunk scaly; buds sticky.

Leaves: Alternate, short-stalked, compound, usually with 13, 15 or 17 leaflets; leaflet blades lance-shaped to narrowly oblong, tapered to an elongate point and rounded to narrowed at the base; 5 to 10 cm long, one-third to one-fifth as wide; dull green above, paler below and hairless or nearly so; margins sharply toothed.

Flowers: White, perfect, five-parted, small and numerous; petals 3 to 4 mm long; in flat-topped to rounded clusters; June to July.

Fruit: Rounded, bright orange red, berry-like pome, 4 to 6 mm across, in clusters; August to September.

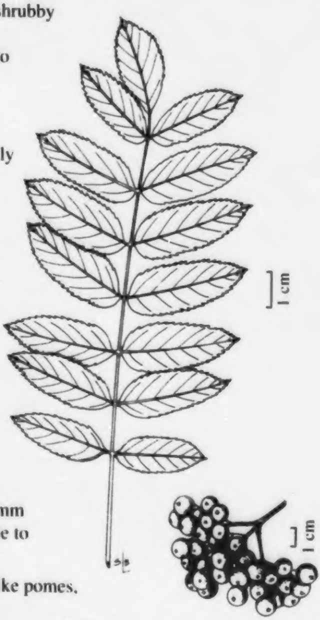
Habitat: Most common on rich soils and moist shaded sites around swamps, thickets and wet conifer stands, but also on drier rocky outcrops where it tends to be more stunted.

Notes: Berry-like fruits (technically pomes, as are apples) are a good source of food for songbirds and grouse; twigs are browsed by moose and deer. Leaves are poisonous.

Stan Vasiliauskas, NEST

Sorbus decora – Showy mountain ash

Rose Family (Rosaceae), Sorbier des montagnes



General: Deciduous, commonly shrubby but also develops into a tree to 10 m high, with a trunk diameter to 50 cm when growing in optimum sites to the south.

Branchlets: Greenish brown to reddish with pale corky horizontally elongate areas (lenticels); older branches red brown and bark of trunk scaly; buds sticky.

Leaves: Alternate, short-stalked, compound, commonly with 13, 15 or 17 leaflets; leaflet blades oblong to narrowly oval, blunt to short-pointed at tip, rounded at base; leaflet blade 3 to 8 cm long, one-half to one-third as wide; blue green above, paler and slightly hairy below; margins sharply toothed.

Flowers: White, perfect, five-part, small and numerous; petals 4 to 5 mm long; in open rounded clusters; June to July.

Fruit: Rounded, bright red berry-like pomes, 4 to 6 mm across, in open clusters; August to September, frequently persisting into winter.

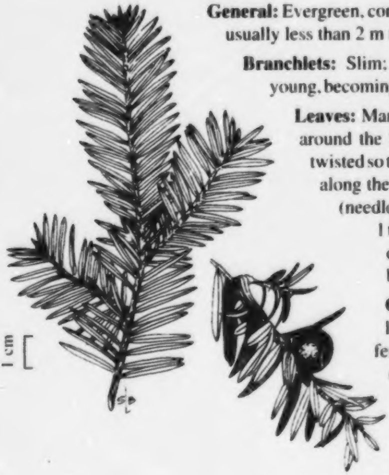
Habitat: Characteristically on rocky shorelines of lakes and rivers, in dry to moist sites; also in open forest habitats and thickets.

Notes: Distinguished from American mountain ash (*Sorbus americana*) by the broader blunter leaflets, and larger flowers and fruit.

K. Baldwin, Canadian Forest Service

Taxus canadensis – ***Ground hemlock***

Yew Family (Taxaceae), If du Canada



General: Evergreen, coniferous, low spreading shrub usually less than 2 m tall.

Branchlets: Slim; greenish and ridged when young, becoming brown and scaly as they age.

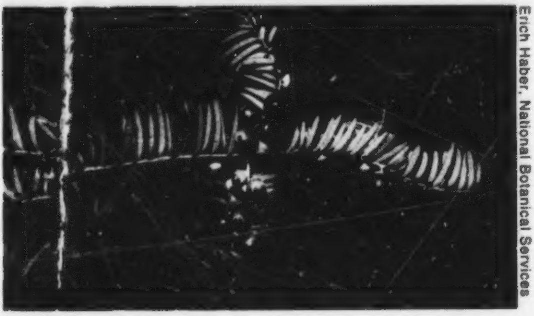
Leaves: Many, arranged in a close spiral around the branch, the short leaf stalks twisted so that the leaves form flat sprays along the branches, the blade is linear (needle-like), 1 to 2.5 cm long and 1 to 3 mm wide, with a sharp tip, dark green above and paler below, margins entire.

Cones: Male cones, tiny, short lived, in axils of leaves; female reproductive structures consist of a single ovule on a short stalk with three pairs of scales in the axils of the leaves; both male and female reproductive structures are relatively easy to see in early spring (May) when pollen is being shed from male cones and there is a pollination droplet on the ovule.

Fruit: The fertilized ovule is a bony brown seed almost totally surrounded by a round cup-like, bright red, fleshy, berry-like aril; the pulpy red aril is sweet and slimy, however, the seed is toxic; July.

Habitat: Rich moist woods, both in conifer and mixedwood stands.

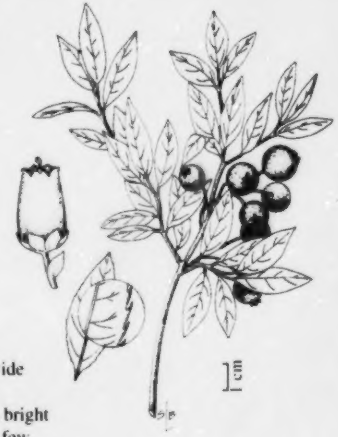
Notes: The branches, leaves and seeds of this species are toxic. Though the needles look similar to those of balsam fir, they can be distinguished since the yew has a pointed tip which the fir does not. American yew is the only conifer in Ontario that is not resinous.



Erich Haber, National Botanical Services

Vaccinium angustifolium – **Early low blueberry**

Heath Family (Ericaceae), Airelle à feuilles étroites (Bleuets)



General: Deciduous, erect, low (usually less than 60 cm tall), bushy shrub, often growing into large patches due to basal creeping branches which root and start new plants.

Branchlets: Young branches greenish-brown with tiny, warty or wrinkled, hairless or finely haired lines running down from the nodes; older stems reddish brown to almost black, hairless, with ridged, flaky bark.

Leaves: Alternate, on very short stalk, simple, oval to elliptic, 2.5 to 4.5 cm long and 6 to 15 mm wide (two to three times as long as wide), tapered or pointed at both ends, thin, bright green and usually hairless (may be a few hairs on the veins) on both sides, margins with tiny bristle-tipped teeth along the entire length.

Flowers: White or pale pink, perfect, urn-shaped, 5 parted, grouped at the end of a branch or in lateral cluster (may flower before the leaves come out or after), less than 6 mm long; May and June.

Fruit: Round, blue or blue-black, often with waxy bloom, berry 6 to 12 mm in diameter; sweet and a favorite with berry pickers; June to August.

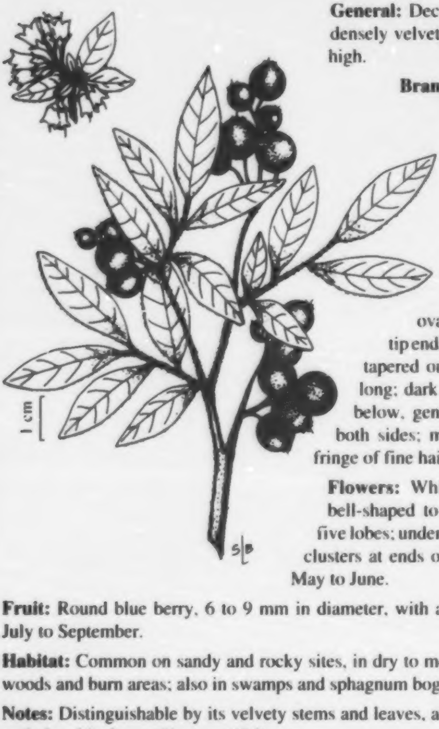
Habitat: Variable, on dry sandy soils, or on organic soils, open woods, sphagnum bogs and clearings.

Notes: This species can best be distinguished from velvetleaf blueberry (*V. myrtilloides*) by the bristle-tipped teeth along the leaf margins. Consumed by many wildlife species.

Bill Crins, MNR

Vaccinium myrtilloides – **Velvetleaf blueberry**

Heath Family (Ericaceae), Airelle fausse-Myrtille



General: Deciduous, low spreading, densely velvety hairy shrub to 60 cm high.

Branchlets: Greenish brown and densely velvety hairy; older branches reddish brown to blackish with peeling bark and wart-like corky erruptions.

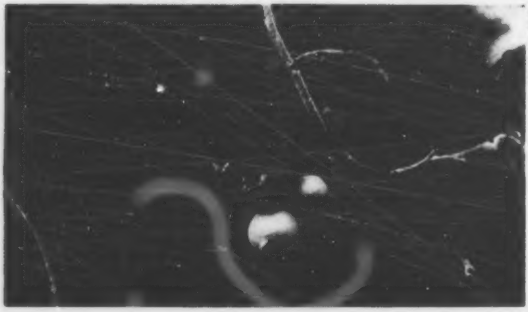
Leaves: Alternate, short-stalked and hairy, simple; blade oval to elliptic, tapered with tip ending in a tiny bristle, base tapered or rounded; 2.5 to 5 cm long; dark green above and paler below, generally downy hairy on both sides; margins entire but with fringe of fine hairs.

Flowers: Whitish to pink, perfect, bell-shaped to short cylindrical with five lobes; under 6 mm long; in crowded clusters at ends of short leafy branches; May to June.

Fruit: Round blue berry, 6 to 9 mm in diameter, with a white sheen (bloom); July to September.

Habitat: Common on sandy and rocky sites, in dry to moist clearings and open woods and burn areas; also in swamps and sphagnum bogs.

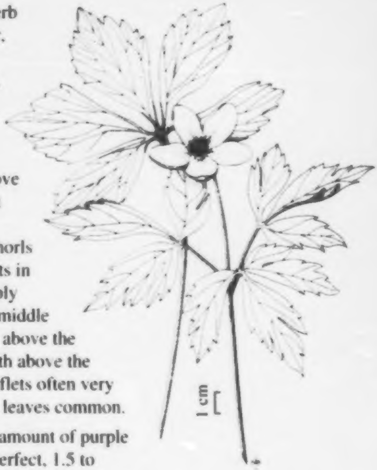
Notes: Distinguishable by its velvety stems and leaves, and entire margins from early low blueberry (*V. angustifolium*).



MNR Photo

Anemone quinquefolia var. quinquefolia – Wood anemone

Buttercup Family (Ranunculaceae), Anémone à cinq folioles



General: Perennial, delicate herb 10 to 20 cm tall, from a slender, underground, horizontal stem (rhizome); stems slightly hairy.

Leaves: Basal leaf singular, with long leaf stalk, deeply cut into 3 to 5 sections with uneven coarse teeth mainly above the middle of the leaf, absent at flowering time; stem leaves smaller, on shorter stalks, in whorls of three around the stem, leaflets in groups of 3 (sometimes so deeply divided as to appear 5 parted), middle leaflet 2 to 5 cm long, broadest above the middle, with coarse uneven teeth above the middle of the leaflet, lateral leaflets often very deeply divided; separate sterile leaves common.

Flowers: White, or with small amount of purple on the underside of the sepal, perfect, 1.5 to 2.5 cm across usually with 5 petal-like sepals, on a hairy flower stalk, usually no more than one flower per plant; May and June.

Fruits: Narrow at both ends and swollen in the middle (fusiform or spindle shaped), brown, dry, hairy, one seed, indehiscent achene 3 to 4 mm long; June though July.

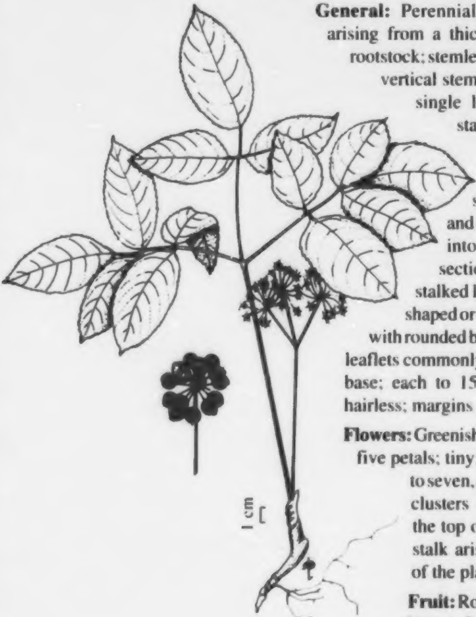
Habitat: Variable, dry to swampy deciduous and mixed woods, in conifer stands and cedar swamps, along streams and river banks.

Notes: Flowers from the anemone family are often referred to as windflowers as their slender stalked flowers are moved easily by a light breeze.

Bill Crinns, MNR

Aralia nudicaulis – ***Wild sarsaparilla***

Ginseng Family (Araliaceae), Aralie à tige nue



General: Perennial, to 50 cm high, arising from a thick woody aromatic rootstock; stemless or with very short vertical stem; plant producing a single leaf and flowering stalk from the top of the rootstock.

Leaves: Basal, single, long-stalked and compound, divided into three parts, each section with three to five stalked leaflets; blades egg-shaped or oval, sharp-pointed with rounded bases with the lateral leaflets commonly asymmetric at the base; each to 15 cm long; surface hairless; margins finely toothed.

Flowers: Greenish white, perfect, with five petals; tiny; clustered into two to seven, often three rounded clusters (umbels) borne at the top of the naked flower stalk arising from the base of the plant; May.

Fruit: Rounded, bluish black berry; 5 to 6 mm across; ripening July to August.

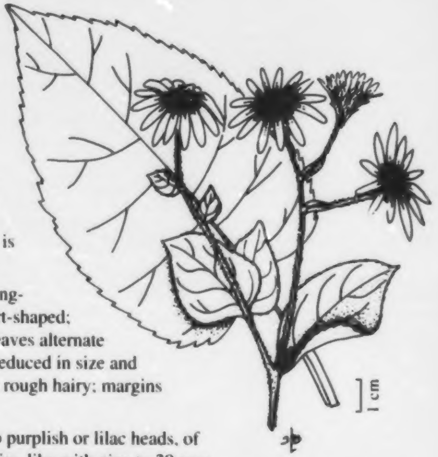
Habitat: Rich woodland soils on dry to moist shaded sites in hardwoods and mixed forests, and in rich peatlands.

Notes: It was once used to brew root beer. Often found with large-leaved aster (*Aster macrophyllus*) and bunchberry (*Cornus canadensis*).

MNR Photo

Aster macrophyllus – ***Large-leaved aster***

Aster Family (Asteraceae), Aster à grandes feuilles



General: Perennial, coarse plant to 1.5 m tall from creeping rootstalk; distinctively large heart-shaped leaves present at base of leafy flowering stalk and tufts of similar leaves on short sterile shoots; the branched flower cluster is prominently glandular.

Leaves: Basal leaves long-stalked, simple and heart-shaped; 4 to 20 cm long; stem leaves alternate and oblong, becoming reduced in size and stalkless; leaves usually rough hairy; margins broadly toothed.

Flowers: In pale blue to purplish or lilac heads, of perfect florets, heads daisy-like with nine to 20 rays, each ray 9 to 15 mm long; heads about 2 cm across with a yellow centre of disc florets soon turning purple; heads arranged into loose flat-topped open clusters with sticky glands; flowering in late summer.

Fruit: Each tiny flower of the head forms a narrow small dry fruitlet (achene) topped by numerous plume-like bristles; about 4 mm long; the flower head forms a dandelion-like ball in September.

Habitat: On mineral soils in dry to moist sites in hardwoods and mixed forests, forest edges, roadsides and on disturbed ground.

Notes: Flowering is usually suppressed under shaded forest cover with large patches of only basal leaves forming.

MNR Photo

Clintonia borealis – ***Blue bead lily***

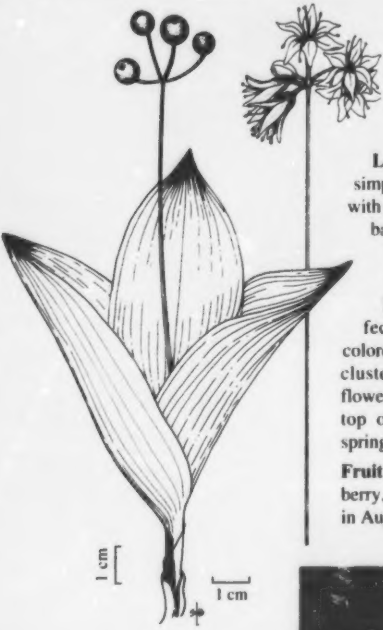
Lily Family (Liliaceae), Clintonie boréale

General: Perennial, to 40 cm high, arising from a slender creeping rootstock that bears a naked flowering stalk with a basal cluster of leaves.

Leaves: Basal, two to five; blade simple, oblong or tongue-shaped with a short pointed tip and clasping base; to 30 cm long; finely hairy; margins entire; veins distinct and parallel.

Flowers: Greenish yellow, perfect and bell-shaped with six colored segments, to 2 cm long, in cluster of two to eight nodding flowers arising as an umbel from the top of the leafless flower stalk; spring and early summer.

Fruit: Rounded dark blue and shiny berry, about 8 mm in diameter; ripen in August.



Habitat: On a variety of soils, in dry to moist hardwood and mixed woodland stands.

Notes: May be confused with three-leaved smilicina *(Maianthemum trifolium)*, but this species has a raceme of small white flowers and a leafy stem. The berries are inedible.

MNR Photo

Coptis trifolia – **Goldthread**

Buttercup Family (Ranunculaceae), Coptide du Groënland

General: Delicate perennial to about 15 cm high, with leafless flower stalks bearing a single flower and long-stalked, three-part leaves; arising from a thread-like yellow to gold rootstock.

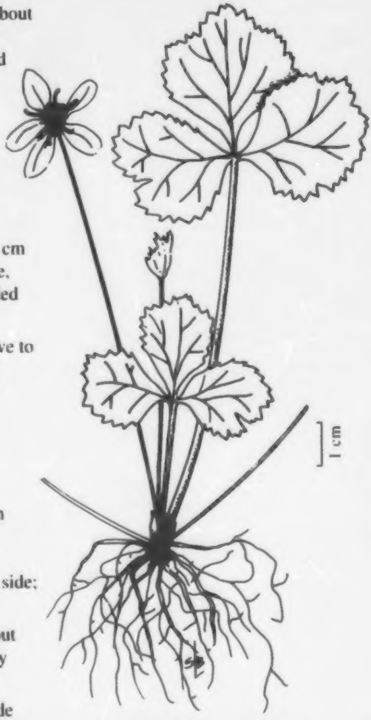
Leaves: Basal on long slender leafstalks, compound, with three leaflets; leaflet blades somewhat wedge-shaped and stalkless, slightly lobed, under 2 cm long; dark green and shiny above, paler below; margins with rounded teeth with sharp points.

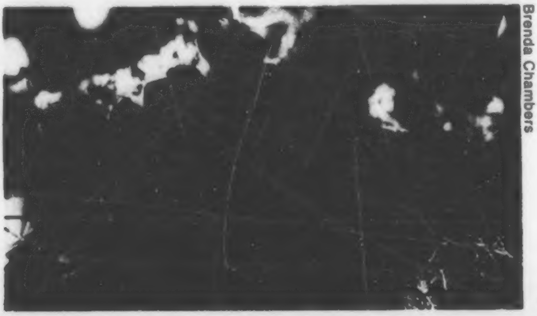
Flowers: White, perfect, with five to seven separate petal-like sepals, flower somewhat star-shaped; 12 to 16 mm wide; solitary at the tip of slender leafless stalks; spring to early summer.

Fruit: Egg-shaped to elliptic, greenish cluster of three to seven smooth dry fruitlets (follicles), with stalks and beaks about 8 to 13 mm long, splitting along one side; July to August.

Habitat: On a variety of soils, but commonly in moist to wet mossy coniferous woods.

Notes: A yellow dye can be made from the rootstock.

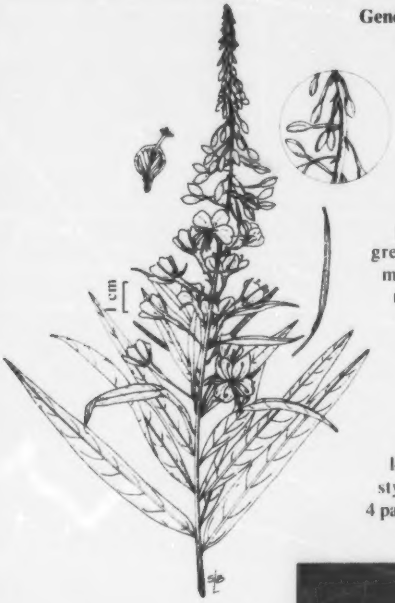




Brenda Chambers

Epilobium angustifolium – ***Fireweed***

Evening-primrose Family (Onagraceae), Épilobe à feuilles étroites (Bouquets rouges)



General: Perennial, erect herb, up to 2 m tall (sometimes taller), from an underground horizontal stem (rhizome).

Leaves: Alternate, without a leaf stalk or with a very short leaf stalk, simple, lance-shaped, up to 20 cm long, tapering to a slender point, hairless or slightly hairy, green on top, paler below; margins toothless or slightly toothed, with conspicuous veins on underside.

Flowers: Pink, pink-purple and occasionally white, perfect, in a long, showy cluster (raceme) at the top of the plant, 4 petals, 1 to 2 cm long, clawed at the base, the style is deeply divided into 4 parts; June to September.

Fruit: Long, narrow, green to red, capsule 2.5 to 8 cm long which splits open to release many seeds 0.8 to 1 mm long with long (9 to 14 mm), fine, fluffy hairs which help the seeds drift on the wind for dispersal.

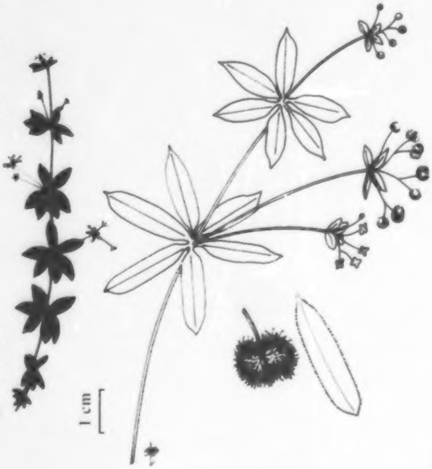
Habitat: Variable, dry woods (jack pine and aspen), open areas, rocky ground shorelines, low wet places, often appearing about three months after a fire.

Notes: This species grows all around the world in northern latitudes.

John E. Thompson, Ontario Parks

Galium triflorum – **Fragrant bedstraw**

Madder Family (Rubiaceae), Gaillet à trois fleurs



General: Perennial, to about 1 m long, trailing or climbing over other plants aided in part by its downwardly hooked spines present at least on the lower parts of the square stems.

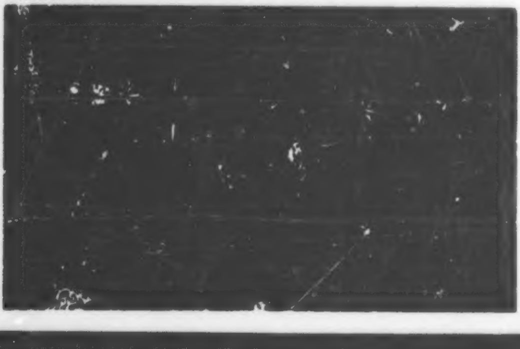
Leaves: Whorled, usually in sixes, minutely stalked; blade simple, narrowly oblong or narrowly elliptic with a short pointed tip and rounded to slightly tapered base; 2 to 8.5 cm long; mainly hairless but with backwardly hooked bristles on the lower side of the leaflet midrib; margins minutely fringed with soft forwardly-curved bristles.

Flowers: Greenish white, perfect, with four petals; 2 to 3 mm wide; clustered commonly in threes on long stalks attached to a simple or repeatedly branched arched main stalk arising from the leaf angles or top of the plant; June.

Fruit: Bilobed and rounded, blackish nutlet, densely covered with hooked bristles; 1.5 to 2 mm across; ripen in August.

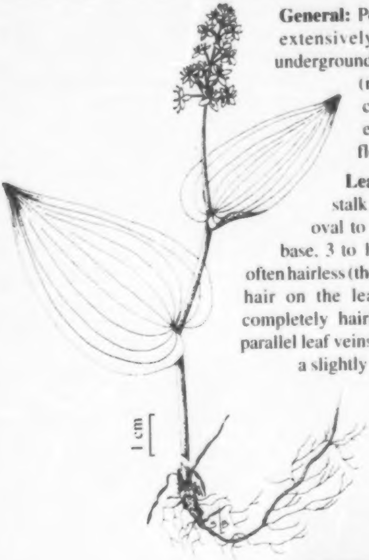
Habitat: On a variety of soils in fresh to moist, shaded forest sites.

Notes: The plant has a strong vanilla fragrance. The common name comes from the ancient use of fragrant species of this genus as an additive to straw mattresses.


MNR Photo

Maianthemum canadense – ***Wild lily-of-the-valley***

Lily Family (Liliaceae), Maïanthème du Canada



General: Perennial herb, up to 20 cm tall, extensively creeping from thread-like, underground, horizontally branching stem (rhizome); often forming large colonies made up mostly, or entirely of individuals that do not flower.

Leaves: Alternate, on a short leaf stalk or without a leaf stalk, simple, oval to egg-shaped, heart-shaped at the base, 3 to 10 cm long, smooth, dark green, often hairless (there is a var. *interius*, that has some hair on the leaf surface, var. *canadense* is completely hairless); margins entire or hairy, parallel leaf veins clearly visible, often 2 leaves on a slightly zigzagged stalk (occasionally 3).

Flowers: White, perfect, star-like with 4 "petals" (tepals), 4 to 6 mm wide, sweetly fragrant, in an erect cluster (raceme) at the end of the flower stem, above the leaves; May and June.

MNR, Algonquin Visitor Centre

Fruit: Round, red (green - green spotted, then turning red) berry, 3 to 4 mm in diameter, with 1 to 2 seeds; July.

Habitat: Almost anywhere, dry or wet, conifer, mixedwood, hardwood, dunes, bogs.

Notes: Also known as Canada mayflower. It can be confused with *Maianthemum trifolium* (three-leaved smilacina), however the smilacina has more elongate leaves and the flower appears to have 6 tepals not 4.

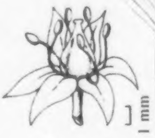
Maianthemum trifolium – ***Three-leaved smilacina***

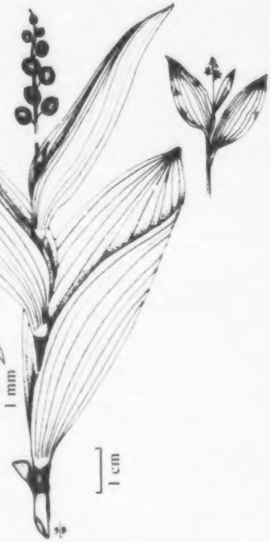
Lily Family (Liliaceae), Smilacine trifoliée

General: Perennial to 20 cm high, forming patches of erect hairless shoots, mainly three-leaved, with prominent parallel veins, arising from creeping slender rootstocks.

Leaves: Alternate and simple; blade oval to oblong or lance-shaped, with pointed tip and stalkless base tapered and clasping the stem; usually 5 to 12 cm long, smooth and hairless; margins entire, veins parallel and prominent.

Flowers: White, perfect, with six petal-like segments; about 8 mm wide; attached on slender stalks on the main flower stalk that generally extends beyond the tops of the leaves; May to June.





B. Livingstone, CDA Museum of Nature

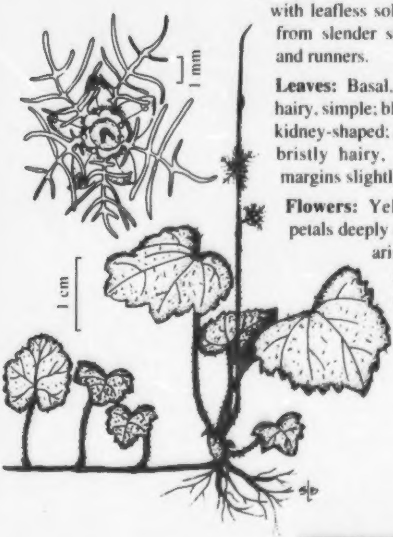
Fruit: Round, dark red berry; about 5 mm across; ripens in June.

Habitat: On organic soils in wet areas; common in bogs, fens and wet spruce stands.

Notes: This plant may be confused with wild lily-of-the-valley (*Maianthemun canadense*) that differs in having leaf blades egg-shaped and short stalked or commonly stalkless and with a heart-shaped base that surrounds the stem, and tiny flowers with four white segments.

Mitella nuda – ***Naked mitrewort***

Saxifrage Family (Saxifragaceae), Mitrelle nue



General: Perennial delicate herb, 5 to 20 cm high, with leafless solitary flowering stalks arising from slender superficial creeping rootstock and runners.

Leaves: Basal, long-stalked and glandular, hairy, simple; blades rounded, heart-shaped or kidney-shaped; about 3 cm across; upper side bristly hairy, lower side sparsely hairy; margins slightly lobed or deeply toothed.

Flowers: Yellowish green, perfect; five petals deeply divided into narrow segments arising from a shallow saucer and having a snowflake-like appearance; 3 to 5 mm across; up to 13 short-stalked flowers scattered along the glandular hairy flower stalk forming a slender wand; June to August.

Fruit: Flattened greenish capsule; under 5 mm across; contains a few black, smooth shiny seeds; August.

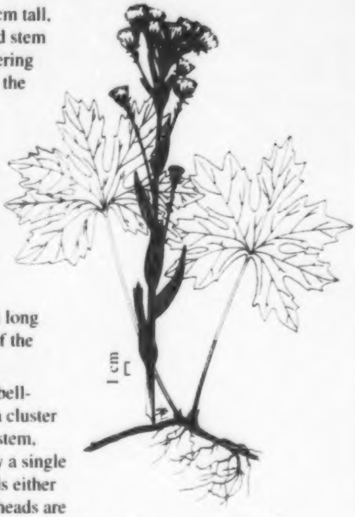
Habitat: Usually in moss, in moist to wet forest habitats.

Notes: Frequently only the hairy leaves are seen. The common name of mitreworts comes from the resemblance of the seed capsule to a bishop's mitre (headdress).

Erich Haber, National Botanical Services

Petasites frigidus var. palmatus – Sweet coltsfoot

Aster Family (Asteraceae), Pétasite palmé



General: Perennial herb up to 60 cm tall, from a thick, creeping underground stem (rhizome) with scaly-bracted flowering stems which appear with or before the leaves.

Leaves: Basal leaves on long, slender leaf stalks, blades almost circular and deeply palmately lobed (3 to 5 lobes), 5 to 25 cm wide, finely haired above and covered with woolly white hair below, more or less toothed; leaves on the flowering stalk reduced to bracts, 2.5 to 6 cm long becoming smaller toward the top of the stalk.

Flowers: Many; creamy white, in bell-shaped, aster-like heads; heads in a cluster on the upper part of the flowering stem, each head surrounded at its base by a single row of bracts 5 to 9 mm long, heads either male or female, flowers in female heads are usually all pistillate and fertile while those in the male heads are primarily hermaphrodite but sterile. Flowers either tubular (disc florets) or strap-shaped (ray florets), appearing with or before the leaves, fragrant; May and June.

Fruit: Linear, dry, brown, small (1.5 to 2.5 mm) indehiscent achene, with white fluffy hairs, forming a compact white fuzzy seed head (like a dandelion), distributed by wind; late May and June.

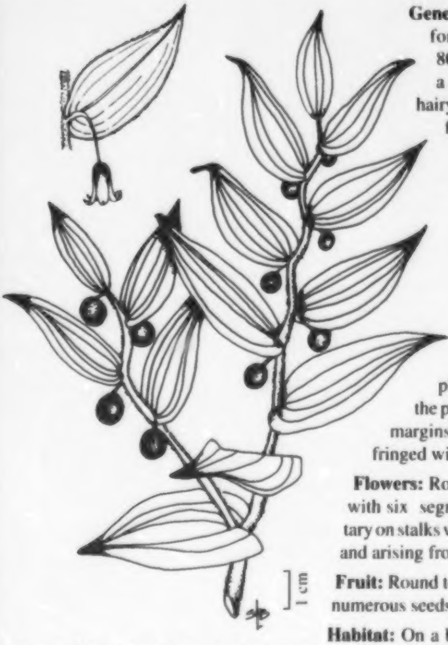
Habitat: Variable; conifer, hardwood and mixedwood stands, wet cedar and black spruce stands, along trails and in clearings.

Notes: Previously known as *Petasites palmatus*. Palmatus means "shaped like a palm."

Rob Arnup, ESG International

Streptopus roseus – **Rose twisted-stalk**

Lily Family (Liliaceae), Streptope rose



General: Perennial, simple or forked upright herb, to 80 cm high, arising from a rootstock; the sparingly hairy stems zigzag slightly from leaf to leaf.

Leaves: Alternate, stalkless and simple; blade lance-shaped to egg-shaped, tapering to a pointed tip and rounded to barely clasping at the base; 5 to 9 cm long; surface generally hairy and somewhat pleated-corrugated along the prominent parallel veins; margins minutely toothed and fringed with fine hairs.

Flowers: Rose, perfect, bell-shaped with six segments; 1 cm wide; solitary on stalks with a bend in the middle and arising from the leaf axils; June.

Fruit: Round to oblong red berry with numerous seeds; 1 cm across; July.

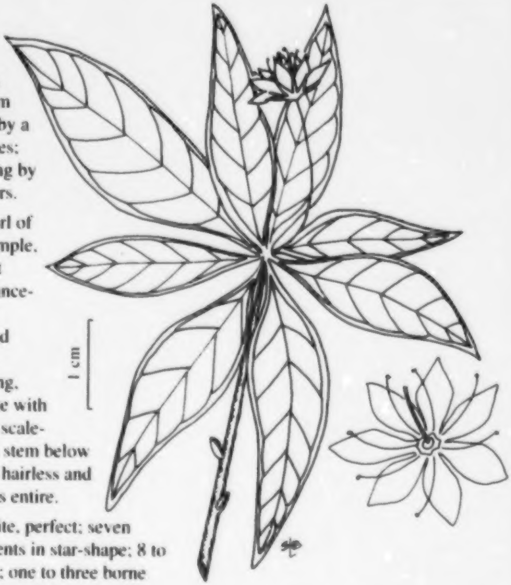
Habitat: On a broad range of soil and site conditions, in rich, fresh to moist areas in hardwood and mixed forest stands.

Note: Can be distinguished from *Streptopus amplexifolius* by its curved flower stalk and pink flowers (*S. amplexifolius* has a kink in the flower stalk and a greenish white flower).

B. Livingstone, CDA Museum of Nature

Trientalis borealis – **Starflower**

Primrose Family (Primulaceae), Trientale boréale



General: Perennial erect delicate herb, to about 25 cm high; topped by a whorl of leaves; plant spreading by slender runners.

Leaves: Whorl of five to ten, simple, at top of short stem; blade lance-shaped, with pointed tip and tapered base; 4 to 10 cm long, unequal in size with tiny scattered scale-like leaves on stem below whorl; blades hairless and shiny; margins entire.

Flowers: White, perfect; seven pointed segments in star-shape; 8 to 14 mm across; one to three borne singly at the tips of slender stalks growing from the centre of the leaf whorl; May to June.

Fruit: Elongate, pale brown, capsule, opening along five valves; under 5 mm long; with numerous tiny black seeds; July.

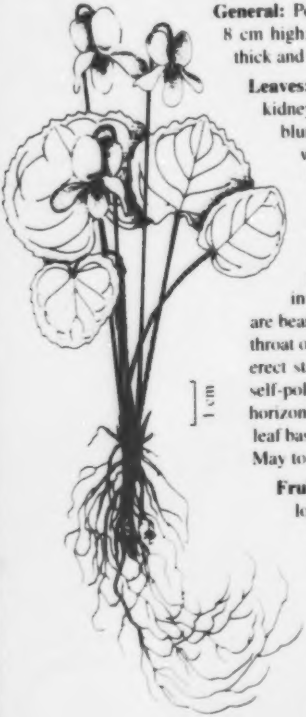
Habitat: On a variety of soils in fresh to moist woodlands and in peatlands.

Notes: The Latin generic name, *Trientalis*, means the third part of a foot, alluding to the small size of the plant.

MNR Photo

Viola renifolia – ***Kidney-leaved violet***

Violet Family (Violaceae), Violette réniforme



General: Perennial, slender, stemless violet, about 8 cm high; arising from a rootstock that becomes thick and scaly with age.

Leaves: Basal, long hairy stalks, simple; blade kidney-shaped to rounded with a rounded or blunt end and heart-shaped base; 1.5 to 8 cm wide; blades generally with soft white hairs on both surfaces when young; margins with broad flat or rounded teeth.

Flowers: White, perfect, five-part with a short rounded spur, the three lower petals having brownish purple veins inside near the base, but none of the petals are bearded (having a dense clump of hair in the throat of the flower); 7 to 10 mm wide; singly on erect stalks overtopping the leaves; tiny closed, self-pollinating flowers also produced on short horizontal or arched stalks, hidden among the leaf bases, that become erect when ripening fruit; May to June.

Fruit: Ellipsoid purplish capsule, 4 to 5 mm long, with numerous rounded brown seeds; July to August.

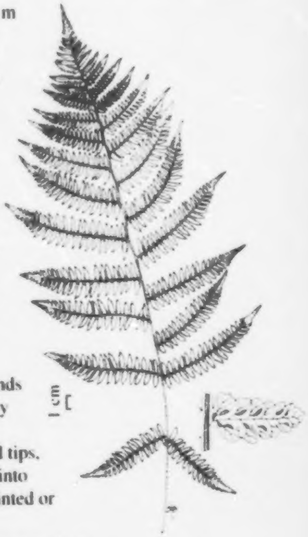
Habitat: On a variety of soils in fresh to moist forested habitats, and in rich peatlands.

Notes: Violets are commonly grouped into those that have leafy stems bearing flowers and those that are stemless and bear naked flowering stalks from the base of the plant.

MNR Photo

Athyrium filix-femina ssp. angustum – Northern Lady fern

Wood Fern Family (Dryopteridaceae), Athyrie fougère-femelle



General: Delicate, showy fern up to 1.1 m tall (usually shorter), roots a thick, horizontal underground stem (rhizome) which is sometimes semi-erect, covered with many scales, 3 to 10 mm long; bearing an abundance of black wiry roots; leafstalks pale green or pale wine, with a grove up the middle, smooth or with a few pale to dark colored scales near the base, brittle.

Leaves: In circular clusters, compound, not evergreen, two to three times divided (bipinnate to tripinnate), blades narrowly to broadly lance-shaped, pale green, to about 76 cm long and 25 cm wide, hairless, with pointed slightly drooping tips, usually tapering at both ends (not always); leaflets arranged alternately or nearly so, up to 20 cm long and 4 cm wide, lance-shaped, with narrow pointed tips, lower leaflets short-stemmed, cut again into subleaflets; subleaflets, toothed, thin pointed or blunt tipped.

Spore cases: On underside of leaflets, often crossing a vein, straight, curved or horseshoe-shaped, dark brown, spore cover (indusium), hairy, often toothed, attached laterally.

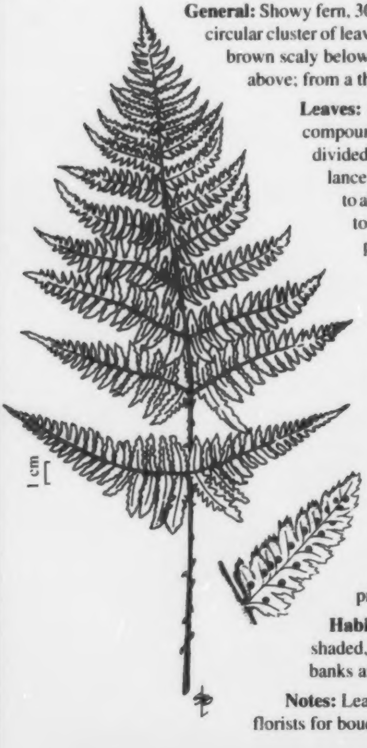
Habitat: Wet or organic soils often in rich forest stands, ditches, stream banks and seepage-ways.

Notes: Can be distinguished from *Dryopteris carthusiana* (spinulose shield fern) as the frond on the northern lady fern usually tapers at both ends, and its spore cases differ (spinulose shield fern has rounded spore cases). This species is circumpolar in distribution.

John E. Thompson, Ontario Parks

Dryopteris carthusiana – ***Spinulose shield fern***

Polypody Family (Polypodiaceae), Dryoptéride spinuleuse



General: Showy fern, 30 to 60 (to 100) cm high, forming a circular cluster of leaves; leafstalks light brown, densely brown scaly below leaflets and with scattered scales above; from a thick scaly underground stem.

Leaves: Clustered in a circle, numerous, compound, with blade two to three times divided into leaflets and sub-leaflets; blade lance-shaped to triangular, dark green, to about 60 cm long; leaflets triangular to lance-shaped below, becoming progressively narrower and shorter above, strongly unequal-sided, especially the lowest pair which have sub-leaflets on the lower side near the base that are conspicuously longer than those on the upper side of leaflet; margins of ultimate leaflet segments sharp-pointed.

Spore cases: Forming rounded clusters (fruitdots) on the underside of sub-leaflet segments near their middle, each cluster covered by a round to kidney-shaped flap of tissue prior to spore release.

Habitat: Generally on rich humus in shaded, fresh to moist woodlands, stream banks and a variety of forest habitats.

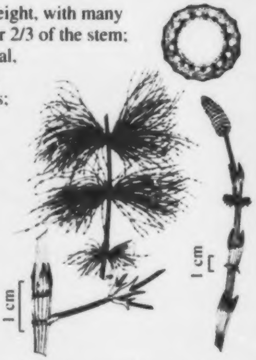
Notes: Leaves have been used commonly by florists for bouquet greenery.

Erich Haber, National Botanical Services

Equisetum sylvaticum – ***Woodland horsetail***

Horsetail Family (Equisetaceae), Prêle des bois

General: Delicate, perennial, up to 60 cm in height, with many lacy whorled branches at the nodes of the upper 2/3 of the stem; from a slender branching, light brown horizontal, underground stem (rhizome) bearing roots and often large oval tubers. Fertile and sterile stems; sterile stems usually taller than the fertile, green, hollow with the central cavity more than half the diameter of the stem, vasculature the same in number as the ridges (10 to 18), each ridge with two rows of straight or hooked spinules which make the stem rough, nodes up to 4.5 cm apart, with sheaths that are green at the base and brown above; fertile stems are flesh colored with short branches, once the cone has fallen, they turn green and branch out with larger sheaths, larger than the sterile stems. Branches 4 or 5 angled, drooping, often branched again into fine, 3-angled deeply toothed branchlets.



Branches: In whorls at the nodes (except the lower nodes), many, delicate, lacy, 4 angled, drooping, often branched again into fine 3-angled deeply toothed branchlets.

Leaves: In whorls at the nodes, joined for a part of their length forming a sheath around the stem; sheaths of sterile stems green at base, chestnut brown above; the number of leaves at a node corresponds to the number of ridges on the internode below.

John E. Thompson, Ontario Parks

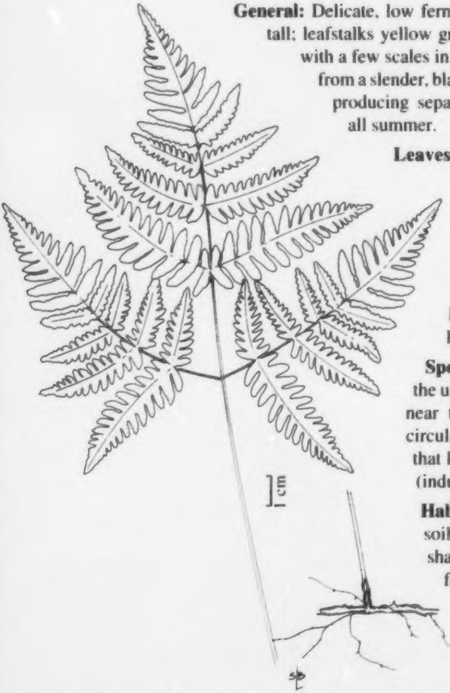
Spore cases: Held in cones that are up to 3 cm long on long stalks at the tips of the fertile stems; after shedding the spores, the cone drops leaving the sterile and fertile stalks appearing almost the same; May to June.

Habitat: Moist to wet mineral or organic soils, woodlands, swamps, openings.

Notes: Woodland horsetail can be distinguished from other horsetails as its branches bear branches. Sheath size (leaf length) is quite variable. On the main axis of the fertile stem, sheaths can be up to 2.7 cm. They are smaller on the main axis of the sterile stems where they are up to 1.3 cm. The smallest sheaths on the branchlets are about 1.0 cm long.

Gymnocarpium dryopteris – ***Oak fern***

Polypody Family (Polypodiaceae), Dryoptéride disjointe



General: Delicate, low fern, mainly under 30 cm tall; leafstalks yellow green with a dark base, with a few scales in the lower half, arising from a slender, black, creeping rootstock producing separate individual leaves all summer.

Leaves: Single, compound, divided into three stalked leaflets each again two to three times divided; blade broadly triangular, yellow green, thin and lacy, to about 18 cm long, 25 cm wide.

Spore cases: Clustered on the underside of the leaflets near the margins in small circular clusters (fruitdots) that lack a protective cover (indusium).

Habitat: On a variety of soils, generally in moist shaded areas in a range of forested sites, typically in black spruce forest.

Notes: Oak fern can be cultivated in pots of rich potting or garden soil and used in a woodland garden.

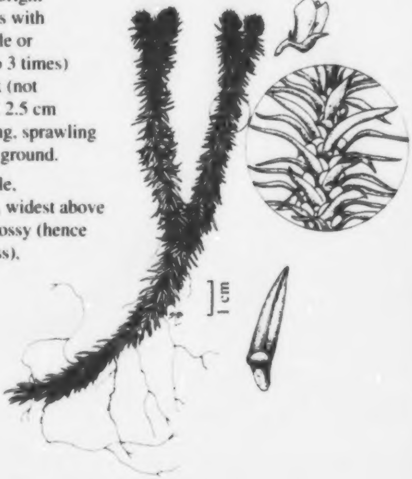
Rob Arnup, ESG International

Huperzia lucidula – **Shining clubmoss**

Clubmoss Family (Lycopodiaceae), Hyperzie brillant

General: Medium sized, bright green, evergreen clubmoss with bristle-tipped leaves; single or few-branched (forked 2 to 3 times) upright stems, 2 mm thick (not including leaves) to about 2.5 cm long, arising from a trailing, sprawling horizontal stem along the ground.

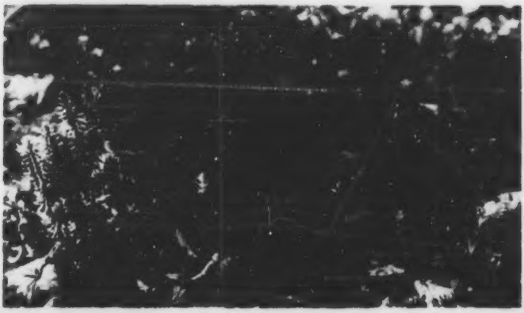
Leaves: Six ranked, simple, needle-like, lance-shaped, widest above the middle, dark green, glossy (hence the name shining clubmoss), 7 to 12 mm long and 1.2 to 2 mm wide, sharply toothed at the end; dead leaves remain on the plant.



Spore cases: In the axils of the leaves (not in a cone as with other clubmosses), kidney-shaped, orange-yellow or yellow, 1.3 to 2.0 mm wide.

Habitat: Rich or acid soils, moist woods and conifer stands.

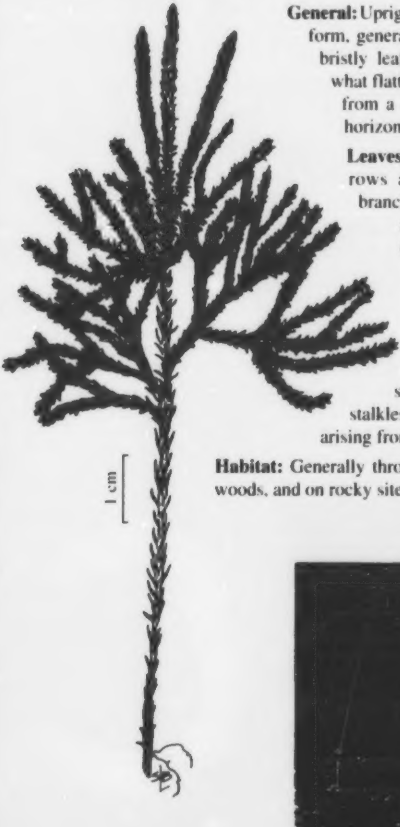
Note: This species can be confused with interrupted clubmoss (*Lycopodium annotinum*) as shining clubmoss may also show interruptions; however, this species does not have cones while interrupted club moss does. Bulbets (gemmae) are often formed in axils of upper leaves. Previously known as *Lycopodium lucidulum*.



Erich Haber, National Botanical Services

Lycopodium obscurum – ***Ground pine***

Clubmoss Family (Lycopodiaceae), Lycopode foncé



General: Upright, branched, tree-like growth form, generally under 25 cm high, with bristly leafy branches forming somewhat flattened fan-like sprays; arising from a deeply seated subterranean, horizontally-spreading rhizome.

Leaves: Numerous, arising along six rows and densely covering the branches; narrow needle-like, tips sharp-pointed, bases tapered, dark green and shiny, about 6 mm long; margins smooth.

Spore cases: Contained on tiny sharp-pointed scales tightly packed into elongate cone-like strobili, each 1 to 4 cm long, stalkless, several to many per plant, arising from the top branches.

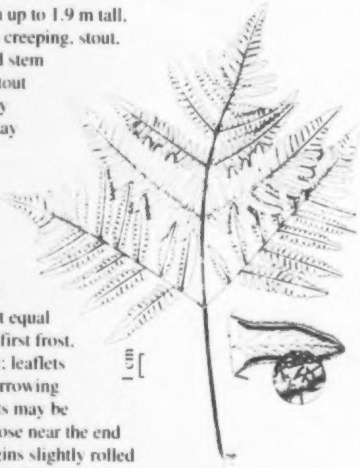
Habitat: Generally throughout fresh to moist open woods, and on rocky sites.

MNR Photo

Notes: Clubmoss spores, because of their highly flammable nature, were once used as flash powder for taking pictures before flash bulbs were invented.

Pteridium aquilinum var. latiusculum – **Bracken fern**

Bracken Fern Family (Dennstaedtiaceae), Ptéridium des aigles



General: Coarse, perennial fern up to 1.9 m tall, often growing in colonies; from creeping, stout, black forked, hairy underground stem (rhizome), up to 1.3 cm thick; stout black roots are scattered sparsely along the rhizome; leaf stalks may be longer or shorter than the blade, smooth, stiff, green turning brown with age, semigrooved at the front.

Leaves: Single, 2 to 3 times compound, triangular, bent almost horizontal to the ground, usually divided into three almost equal parts, green turning brown with first frost, up to 90 cm long by 90 cm wide; leaflets alternate or nearly so, oblong narrowing towards a blunt tip, lower leaflets may be divided into subleaflets while those near the end will not be further divided, margins slightly rolled under; subleaflets narrow, variable in shape, blunt tipped, often with hairs at the tip and along the midvein.

Spore cases: In a narrow line along the edge of the leaflet, silvery when young, becoming brown as they age; the spore case cover is formed by the rolled-under edge of the leaflet.

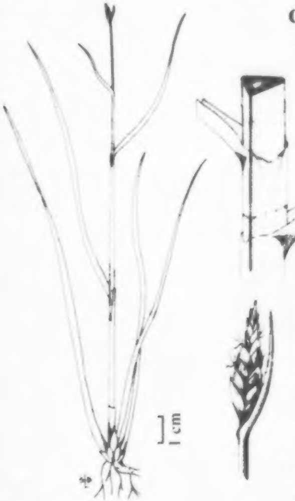
Habitat: Open areas, damp or more often dry soil, in open woods, frequent in burnt-over areas.

Notes: Found all around the world. Plants growing in shade often orient their fronds towards the light.

Rob Arnup, ESG International

Carex spp. – ***Sedge***

Sedge Family (Cyperaceae), Carex, Laöche



General: Perennial, grass-like herbs, small and delicate to large and coarse with fibrous roots or spreading by rhizomes; stems commonly three-angled.

Leaves: Often three ranked (arising along the angles of the stem); blades simple, narrow and elongate with sheaths enclosing the stem; size variable, delicate to coarse; surface generally hairless; margins entire; veins parallel.

Flowers: Drab greenish, highly modified and without petals, unisexual; tiny and aggregated into narrow male, female and mixed gender spikes, rarely on separate male and female plants; pistil enclosed in a rounded or flattened, bottle-like sac (perigynium); flowering occurs in spring and early summer.

Fruit: Nutlet-like achene, pale to dark, small and hard with persistent style and surrounded by the papery perigynium.

Habitat: Variable, from dry mineral to wet organic soils, in open and woodland sites but most abundant and common in open wet habitats.

Notes: Although grass-like in general appearance, sedges differ from grasses in having a solid, not hollow, stem filled with pith cells, closed (not open) leaf sheaths that surround the stem, and commonly have three-angled stems ("sedges have edges").

Erich Haber, National Botanical Services

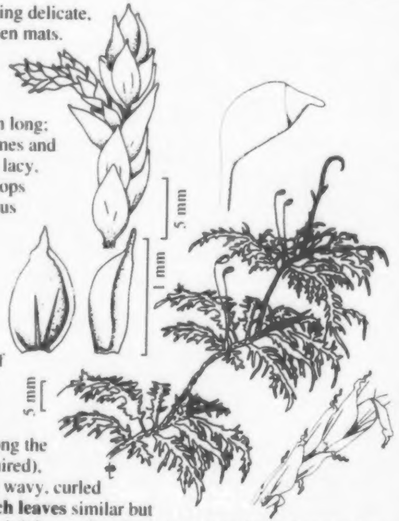
Hylocomium splendens – Stair-step moss

Hylocomium Family (Hylocomiaceae), Hypne éclatante

General: Feathermoss forming delicate, ferny, yellowish or olive green mats.

Stems: Arched and wiry, reddish to brownish and covered with tiny green branched filaments; to 15 cm long; stems branch two to three times and form a somewhat triangular lacy, ferny mat; a new stem develops from the centre of the previous year's growth and forms another highly branched ferny layer, each representing a "step" in the mossy staircase.

Leaves: Midrib double, about one-third to one-half of the leaf length. **Stem leaves** egg-shaped with sharply pointed tip, concave and spoon-like with tiny teeth along the upper margin (hand lens required), loosely overlapping and with wavy, curled tips; about 3 mm long. **Branch leaves** similar but smaller than stem leaves and tightly overlapping but without the curly tips; about 1.2 mm long.



Capsules: Egg-shaped to oblong-cylindric, brown to reddish brown, with a beaked lid; about 1.5 to 2.5 mm long; held horizontally and roughly at right angle to the long smooth reddish stalk and scattered in small groups along the stem.

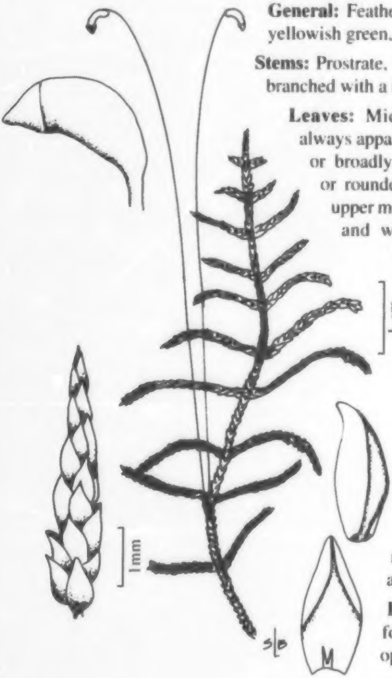
Habitat: On humus, mineral and organic soils and decaying wood in a variety of fresh to wet forested habitats, commonly in conifer stands. Often associated with other feathermosses such as Schreber's moss (*Pleurozium schreberi*) and plume moss (*Ptilium crista-castrensis*).

Notes: Easily recognized by its distinctive branching and step-like appearance.

MNR Photo

Pleurozium schreberi – **Schreber's moss**

Entodon Family (Entodontaceae), Hypne de Schreber



General: Feathermoss, glossy, light green to yellowish green, forming loose mats.

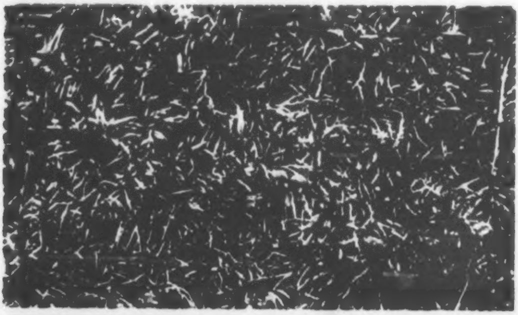
Stems: Prostrate, red, to 15 cm long; pinnately branched with a feather-like appearance.

Leaves: Midrib double and short, not always apparent. **Stem leaves** egg-shaped or broadly oval with short blunt point or rounded tip, concave and with the upper margin commonly rolled inward and with tiny teeth near the tip (hand lens required), loosely overlapping and exposing the red stem; 1.5 to 2.0 mm long. **Branch leaves** similar, overlapping, and smaller; about 1.5 mm long.

Capsules: Cylindrical, curved, brown to reddish brown, with slightly pointed lid; about 4 mm long; held inclined to horizontal on long smooth red stalk and scattered singly along the stem.

Habitat: On a wide range of forest soils and sites in shady to open areas.

Notes: This is the most common of the feathermosses in the boreal forest of northern Ontario.



MNR Photo

Ptilium crista-castrensis – **Plume moss**

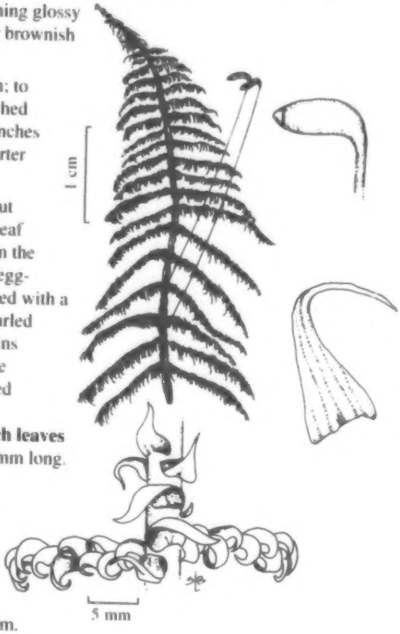
Hypnum Family (Hypnaceae), Hypne plumeuse

General: Feathermoss forming glossy bright green to yellowish or brownish green loose tufts or mats.

Stems: Semi-erect, greenish; to 10 cm long; pinnately branched and plume-like with the branches becoming progressively shorter toward the tip.

Leaves: Midrib double, about one-half the length of stem leaf but short and often lacking in the branch leaves. **Stem leaves** egg-shaped to oblong lance-shaped with a long pointed, prominently curled tip facing downwards; margins curved inwards from the base upwards and minutely toothed toward tip of leaf (hand lens required); 3 mm long. **Branch leaves** similar but smaller; 2 to 2.5 mm long.

Capsules: Cylindrical and curved, reddish brown, with a slightly pointed lid, 2 to 3 mm long; held horizontally on elongate flexuous orange to red stalk and scattered singly along stem.



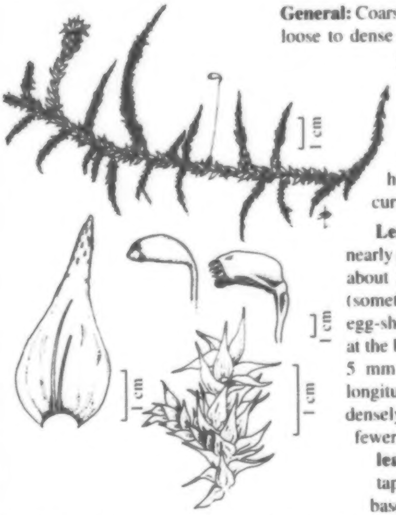
Habitat: On a wide range of forest soils and substrate such as mineral soil, boulders, humus, stumps and logs in dry, shaded to wet coniferous woods.

Notes: This large feathermoss is distinctive because of its plume-like appearance and strongly inrolled and curved leaves; it is common throughout the Boreal Forest Region.

MNR Photo

Rhytidiadelphus triquetrus – *Electrified cat-tail moss*

Hylocomium Family (Hylocomiaceae), Hypne triquètre



General: Coarse and robust moss growing in loose to dense mats or tufts, dark to bright yellow or green.

Stems: Creeping to erect, orange-red, 4 to 15 cm long, irregularly and unequally branched on all sides; branches horizontal, mostly tapered and curving downwards at the tips.

Leaves: Midrib double, slender, nearly parallel, short or extending for about 2/3 of the length of the leaf (sometimes lacking). **Stem leaves** egg-shaped to heart-shaped, clasping at the base, with tapering tips, 3.5 to 5 mm long, smooth or folded in longitudinal pleats (plicae), margins densely toothed near the tips with fewer teeth towards the base. **Branch leaves** egg-shaped to oblong, tapering to a tip with a clasping base, 1.5 to 3 mm long, margins finely toothed, sometimes more densely toothed near the tip, leaves at the end of the branches are wide-spreading as if the bud had been broken off, this contributing to the "electrified" appearance of this moss.

Capsules: Oblong to egg-shaped, held horizontally, short-necked, asymmetric and somewhat furrowed when dry, red-brown, 1.5 to 3 mm long; held on a stalk 15 to 45 mm long.

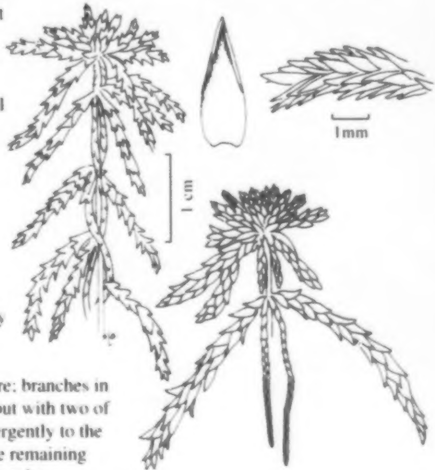
Habitat: On humus, soil and logs in dry or moist forest.

Notes: Also referred to as shaggy moss or rough neck moss.

Rob Arnup, ESG International

Sphagnum angustifolium

Peat Moss Family (Sphagnaceae), Sphaigne



General: A slender peat moss of small to medium size, greenish to yellowish brown in appearance; the terminal head of densely clustered branches is small, flat or rounded and somewhat star-like.

Stems: Upright, ranging in color from pale green to yellowish but are usually distinctly pinkish; 9 cm high; flexible, and with a yellow green central core; branches in clusters of four to five but with two of each cluster spread divergently to the side and thicker than the remaining drooping, thread-like branches.

Leaves: Midrib absent. **Stem leaves** triangular, with generally blunt tips, margins occasionally with minute teeth; to about 0.8 mm. **Branch leaves** egg to lance-shaped, wavy and curved towards the underside on dry branches; up to 1 mm long.

Capsules: Not commonly seen in most species of peat moss; generally globose, dark brown to black, 1 to 2 mm in diameter, on short erect stalk from terminal head.

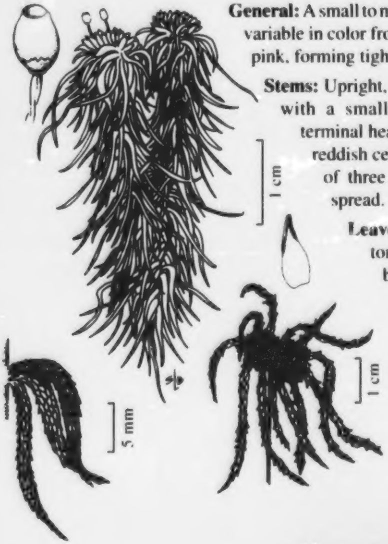
Habitat: Most commonly in open wooded fens and swamps; also in bog depressions above the water level and on damp humus.

Notes: Characterized by its slender shape, often pinkish stem and distinctive pairs of divergent branches.

MNR Photo

Sphagnum capillifolium

Peat Moss Family (Sphagnaceae), Sphaigne



General: A small to medium sized slender peat moss, variable in color from green to mottled with red or pink, forming tight carpet-like mounds.

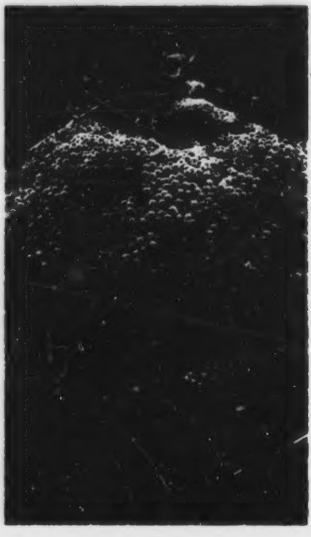
Stems: Upright, greenish, occasionally forked, with a small rounded and often double terminal head; 5 to 8 cm high; stiff, with a reddish central core; branches in clusters of three to five with two divergently spread.

Leaves: Midrib absent. **Stem leaves** tongue-shaped to oblong, with bluntly pointed notched or fringed tip with margins near tip inrolled (use hand lens), 1.0 to 1.8 mm long. **Branch leaves** egg to lance-shaped, with a pointed tip and margins that are inrolled near the tip, about 1.2 mm long.

Capsules: Not commonly seen in most species of peat moss; generally globose, dark brown to black, 1 to 2 mm in diameter, on short erect stalk from terminal head.

Habitat: On hummocks or mounds in bogs or fens, and on humus soil or wet rocks in moist to wet coniferous woodlands.

Notes: Characterized by its sweeping and outward curving branches that resemble long hair. All peat mosses are capable of absorbing a large amount of liquid due to their specialized cell structure. Formerly *Sphagnum nemoreum*.



Rob Arnup, ESG International

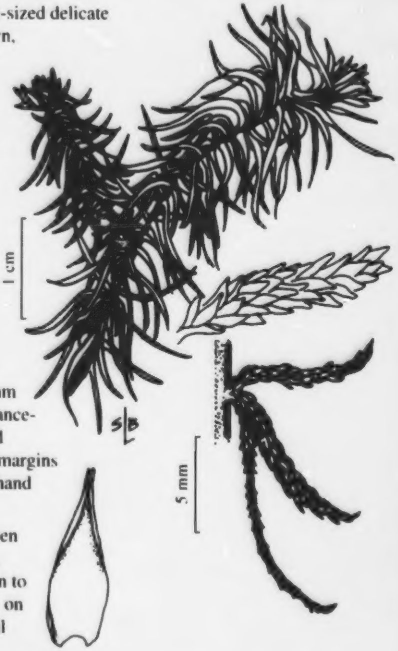
Sphagnum fuscum

Peat Moss Family (Sphagnaceae), Sphaigne

General: A small to medium-sized delicate peat moss forming dark brown, greenish or reddish brown compact cushions.

Stems: Upright, brownish, lacking conspicuous terminal heads; 10 cm high; flexible with a brown central core; branches in clusters of three to five with two divergently spread.

Leaves: Midrib absent. **Stem leaves** tongue-shaped, with a widely rounded tip that is smooth or minutely ragged, 0.8 to 1.1 mm long. **Branch leaves** egg to lance-shaped, tapered to a point and inrolled near the tip with the margins finely toothed at the tip (use hand lens), about 1 mm long.



Capsules: Not commonly seen in most species of peat moss; generally globose, dark brown to black, 1 to 2 mm in diameter, on short erect stalk from terminal head.

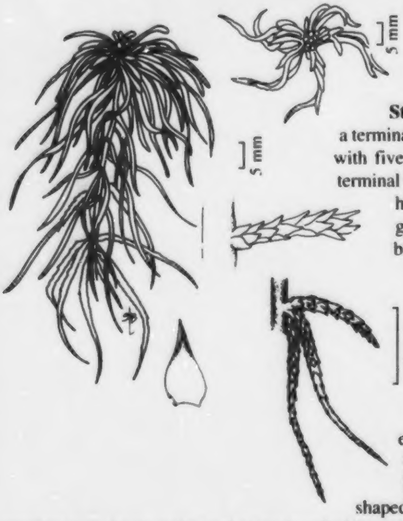
Habitat: On the top of hummocks in the drier parts of poor open bogs and in poor black spruce peatlands.

Notes: Characterized in the field by its brown color and characteristic position on top of hummocks.

MNR Photo

Sphagnum girgensohnii

Peat Moss Family (Sphagnaceae), Sphaigne



General: Medium to large peat moss, forming loose, greenish to yellowish or brownish green carpets.

Stems: Upright, greenish, with a terminal small flat star-shaped head with five points and a distinct shiny terminal bud in the centre; about 8 cm high; stiff but flexible, with a green to brown central core; branches in clusters of three to five that droop downwards almost perpendicularly.

Leaves: Midrib absent. **Stem leaves** widely tongue-shaped, slightly longer than wide with tips blunt or flat with a ragged edge, tightly pressed against the stem, 1.0 to 1.3 mm long. **Branch leaves** egg to lance-shaped, tapered to a pointed tip, the margins near the tip entire and strongly rolled inwards, about 1.3 mm long.

Capsules: Not commonly seen in most species of peat moss; generally globose, dark brown to black, 1 to 2 mm in diameter, on short erect stalk from terminal head.

Habitat: Generally on rich peatlands, on damp humus to wet areas in boggy woods and white cedar swamps.

Notes: One of the most common of the peat mosses. It is characterized by its star-shaped top, spreading branches that hang almost perpendicularly to the stem and the squarish stem leaves with their flat ragged tip.

Brenda Chambers

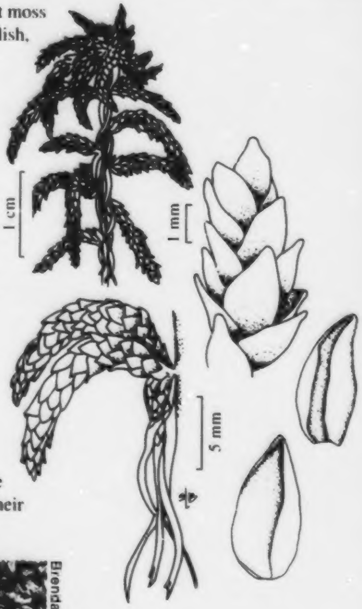
Sphagnum magellanicum

Peat Moss Family (Sphagnaceae), Sphaigne

General: A medium to large peat moss characteristically reddish or purplish, sometimes light green in color.

Stems: Upright, reddish, terminal head not well developed; about 11 cm high; flexible, with red central core; branches in clusters of four to six with two to three divergent spread, these appear characteristically short and thick, the remainder are slender and drooping parallel beside the stem.

Leaves: Midrib absent. **Stem leaves** tongue or spatula-shaped, with a widely rounded and minutely fringed tip, about 2 mm long. **Branch leaves** widely egg-shaped, prominently concave and with the margins minutely fringed along their entire length, 2 mm long.



Brenda Chambers

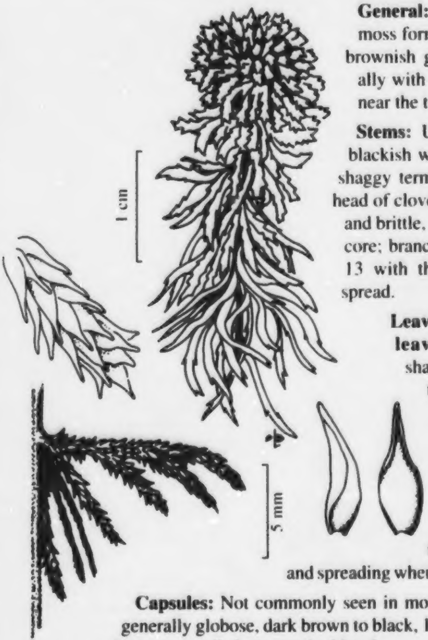
Capsules: Not commonly seen in most species of peat moss; generally globose, dark brown to black, 1 to 2 mm in diameter, on short erect stalk from terminal head.

Habitat: On poor to rich sites in moist to wet areas, on the sides and tops of hummocks in bogs, fens and treed peatlands.

Notes: Can be recognized by its robust appearance, thick or swollen branches and generally red color when in the open. It may be green when shaded.

Sphagnum wulfianum

Peat Moss Family (Sphagnaceae), Sphaigne



General: A medium to large peat moss forming loose dark green to brownish green carpets, occasionally with a pink to light red tinge near the top.

Stems: Upright, dark brown to blackish with a large rounded and shaggy terminal head resembling a head of clover; 9 cm high; stiff, wiry and brittle, with a red brown central core; branches in clusters of six to 13 with three to six divergently spread.

Leaves: Midrib absent. **Stem leaves** triangular-tongue-shaped, with a rounded entire or weakly fringed tip, to about 0.7 mm long. **Branch leaves** egg to lance-shaped, tending to be tubular above and tapering to a long pointed tip, toothed across the top, and spreading when dry, about 1.5 mm long.

Capsules: Not commonly seen in most species of peat moss; generally globose, dark brown to black, 1 to 2 mm in diameter, on short erect stalk from terminal head.

Habitat: On humus and rotting logs, in moist to wet sites; common in black spruce and white cedar swamps.

Notes: Has a large, distinctive clover-like head, brittle stem and tiny stem leaves.

MNR Photo

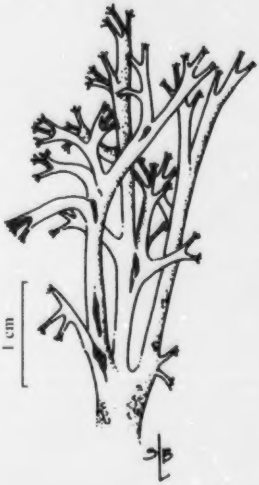
Cladina rangiferina – **Reindeer lichen**

Reindeer Lichen Family (Cladoniaceae), Cladine rangifère

General: Shrubby erect growth form with distinct stems and numerous hollow branches, silver or blue grey in color; tips of terminal branches browned and curved in one direction; forming extensive colonies of entangled clumps.

Habitat: On mineral soils, humus, and over rocks in dry to moist open coniferous forest sites, and in poor peatlands.

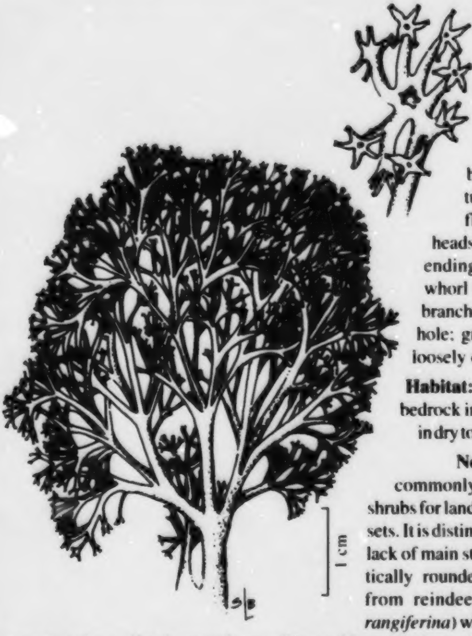
Notes: It is distinguishable by its color from the similar looking *Cladina mitis* which is greenish yellow and from coral lichen (*Cladina stellaris*) which is distinctly yellowish or green grey and has a densely branched growth form resembling rounded heads of coral or cauliflower.



MNR Photo

Cladina stellaris var. stellaris – **Coral lichen**

Reindeer Lichen Family (Cladoniaceae), Cladine étoilée



General: Shrubby erect growth form, without a distinct main stem, yellowish or green grey, consisting of hollow, tightly branched rounded tufts of coral or cauliflower-like compact heads; terminal branches ending in a star-shaped whorl of four to five tiny branches around a central hole; grows in separate or loosely clumped colonies.

Habitat: On infertile sand or bedrock in open dry areas and in dry to fresh conifer stands.

Notes: This lichen is commonly used as trees or shrubs for landscaping model train sets. It is distinguished by its color, lack of main stem and characteristically rounded coral-like heads from reindeer lichen (*Cladina rangiferina*) which is silver or blue grey in color and has browned curved tips and from *Cladina mitis* which is greenish yellow; both of these two lichens have a distinct main stem and lack the rounded tufted appearance.

MNR Photo

Introduction to Applications

This section contains several forest management interpretations for the NE-FEC ecosites. These interpretations are intended as examples, as a starting point for developing your own applications.

Site classifications provide a framework for rating an ecosystem's probable response to a natural disturbance, or to a specific management prescription, based on its ecological characteristics and on past management experience on similar ecosystems. Types with similar capability or response characteristics can be grouped together into broader classes according to practical needs. These qualitative ratings represent hypotheses that can be tested, either in an operational setting, or by more rigorous empirical and process research.

There are a variety of ways to practically extract, organize or present management information relative to NE-FEC ecosites, vegetation types and soil types. These include developing tables, fact sheets, decision flowcharts, and vegetation and ecosite diagram overlays. Many of these formats were successfully applied while developing management interpretations related to other site classification systems (e.g. Racey *et al.* 1989).

The interpretations in this section are presented schematically on ecosite diagrams, which provide a useful visual framework for comparing the ecosites. Included are interpretations of vegetation and soil features by ecosites for tree species, forest humus forms, forest floor types, black spruce and balsam fir advance growth, and post-harvest fire spread classes.

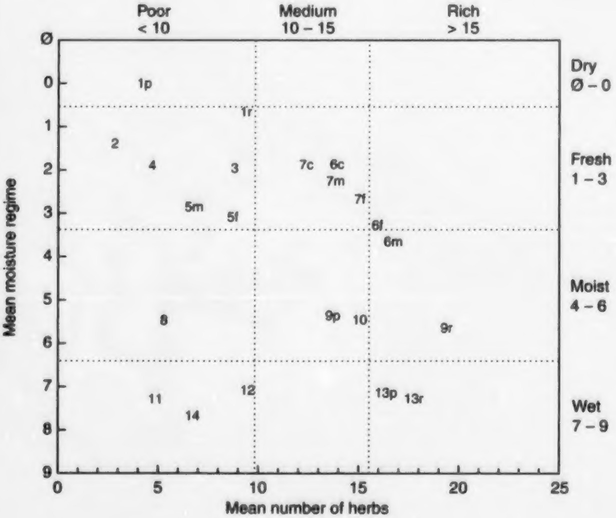
Introduction to the Ecosite Diagram

The ecosite diagram plots average values for each ecosite on axes of soil moisture regime and the number of herb species. Each ecosite occurs across a range of values for moisture regime and for the number of herb species. These ranges are not shown on the diagram. Only the average (or "modal") condition is shown for each ecosite.

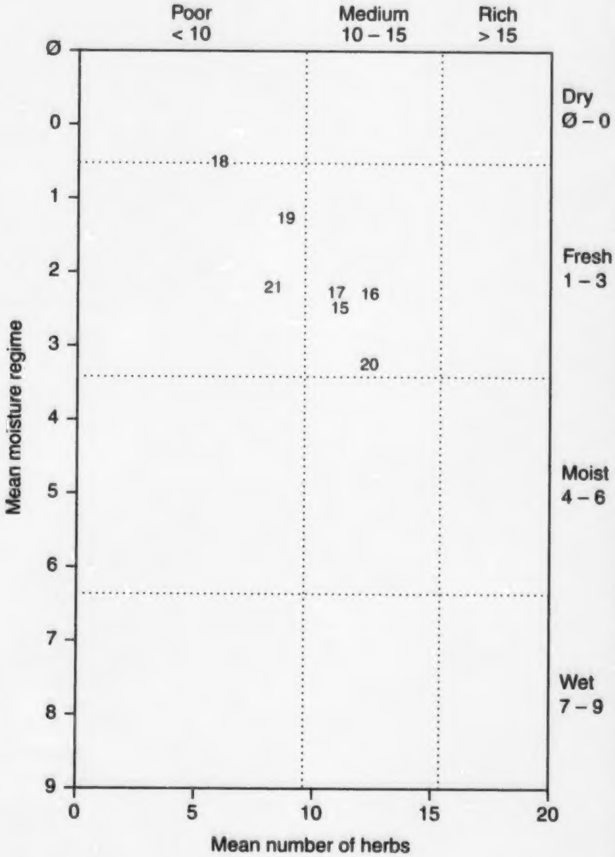
The purpose of the ecosite diagram is to provide a simple, two-dimensional framework for displaying interpretive material that can be related to the ecosites. Separate diagrams are provided for ES1 to ES14 and ES15 to ES21. Five examples of interpretive overlays are provided in this section:

- Tree Species
- Forest Humus Forms
- Forest Floor Types
- Abundance of Advance Growth
- Post-harvest Fire Spread Classes

Ecosite Diagram – Ecosites 1 to 14



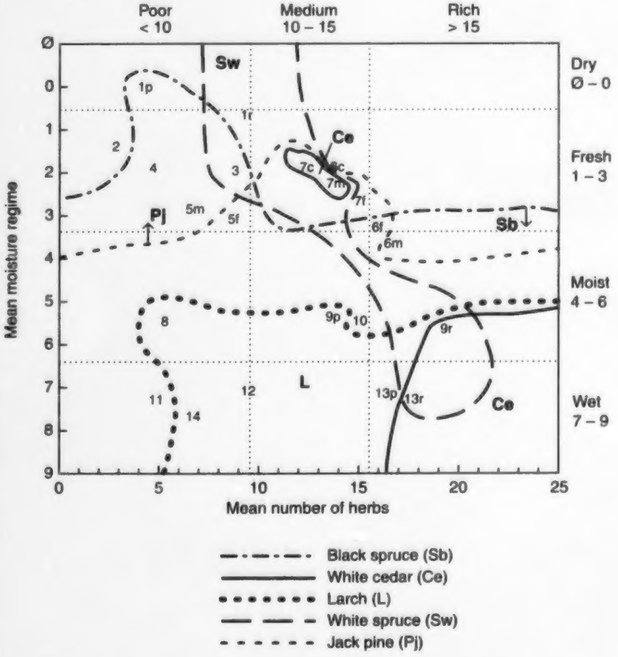
Ecosite Diagram – Ecosites 15 to 21



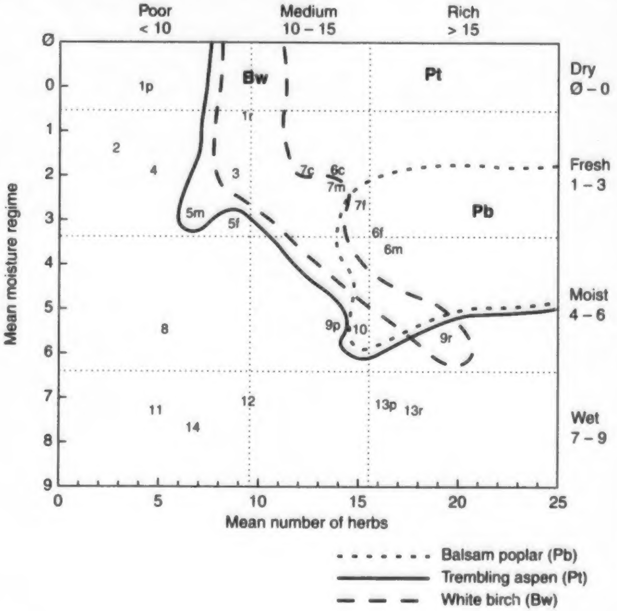
Tree Species

These diagrams show how the occurrence of coniferous and deciduous tree species is related to the ecosites. For commonly occurring tree species, ranges of ecosites are delineated that contained these species in the main canopy in at least 20 percent of the samples. Less common tree species, including white cedar and larch, occur in fewer plots in the sample. Therefore, ranges of ecosites are delineated that contained these species in at least five percent of the samples. Black ash and white elm occur in only a small number of sample plots, in the same moisture and richness ranges as balsam poplar. Note that black spruce occurs on all ecosites (its frequency of occurrence and percentage cover values are highest on poor, fresh to wet sites). Balsam fir occurs on all ecosites except ES11 and ES14 (its frequency of occurrence and percentage cover values are highest on medium to rich, fresh to moist sites).

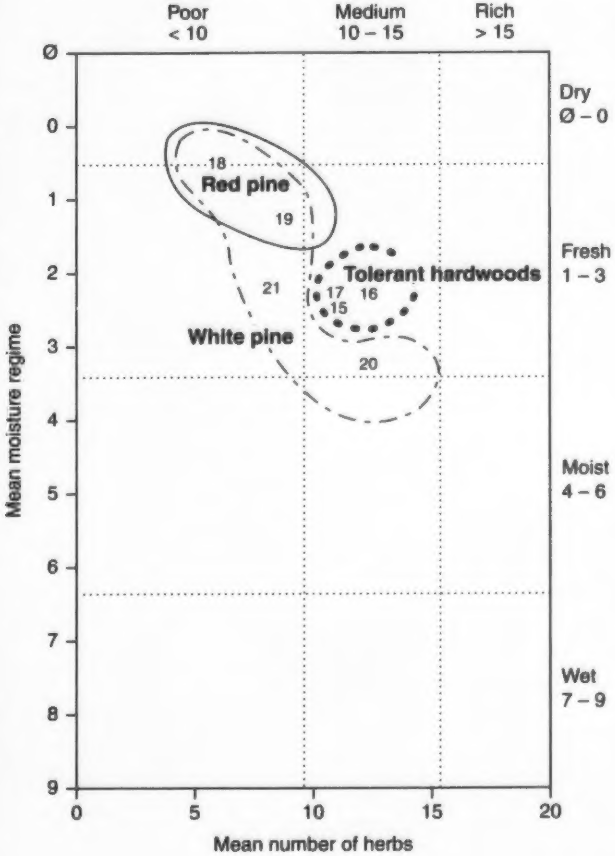
Ecosites 1 to 14 – Conifers



Ecosites 1 to 14 – Deciduous



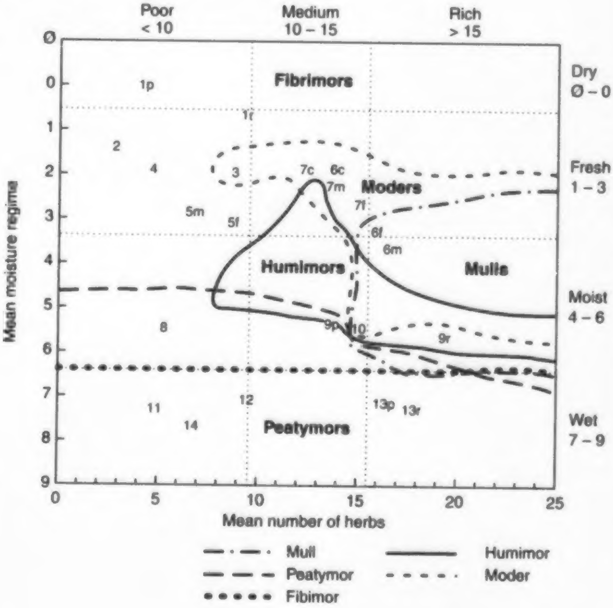
Ecosites 15 to 21 – Hardwood and Pine



Forest Humus Forms

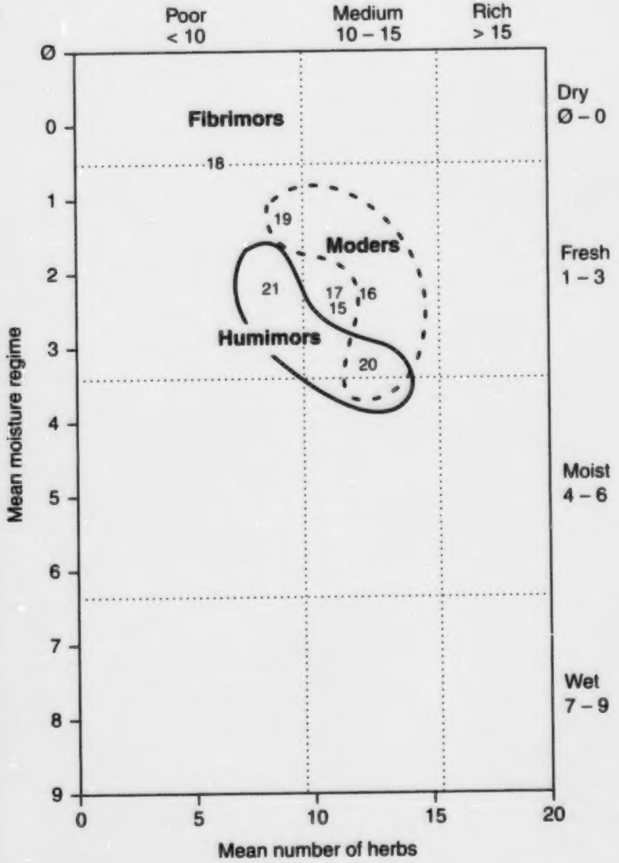
These diagrams show how the occurrence of fibrimors, moders, humimors, mulls and peaty mors are related to the ecosites. For each forest humus form class, ranges of ecosites are delineated that had these humus forms in at least ten percent of the samples. Since mulls are less common, a range of ecosites is delineated that had mull humus forms in at least five percent of the samples. Moders occur in more than ten percent of most upland ecosites (ES1p to ES10) but are most common (occurring in at least thirty percent of the samples) within the delineated range.

Ecosites 1 to 14



...Forest Humus Forms

Ecosites 15 to 21

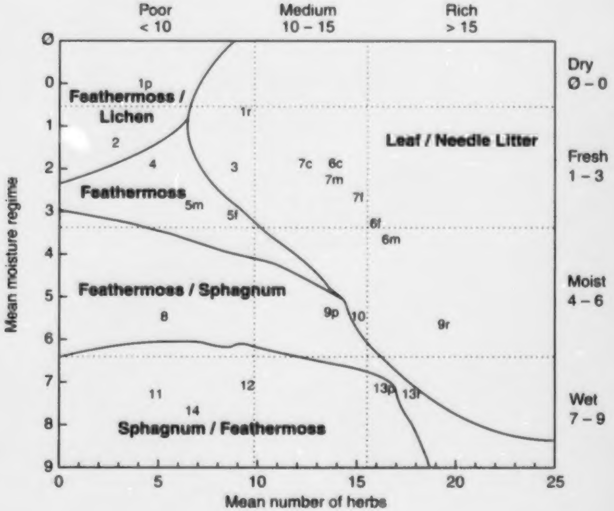


Forest Floor Types

These diagrams show the dominant materials on the forest floor in relation to the ecosites. The dominant forest floor materials are:

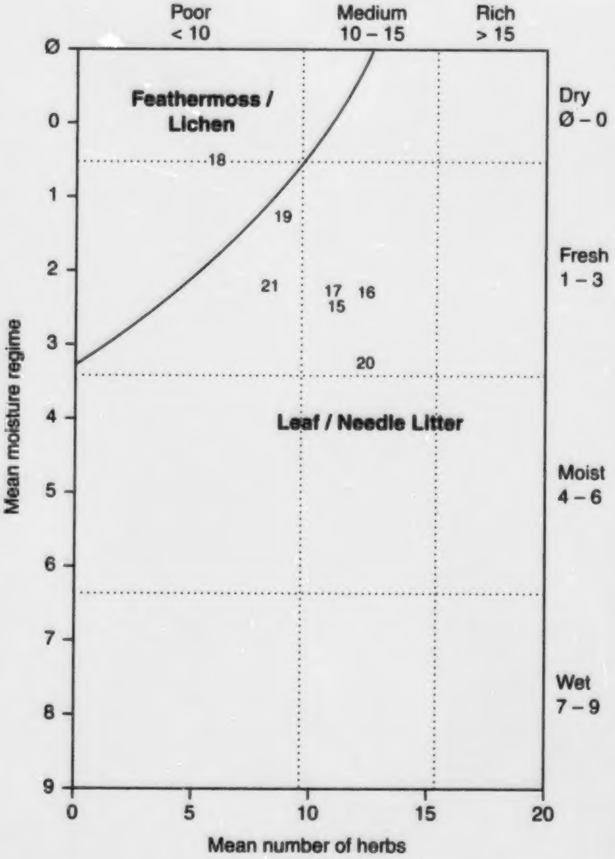
- Mixed feathermoss and lichen
- Feathermoss
- Litter (deciduous leaves and conifer needles)
- Mixed feathermoss and Sphagnum spp.
- Sphagnum spp. and feathermoss

Ecosites 1 to 14



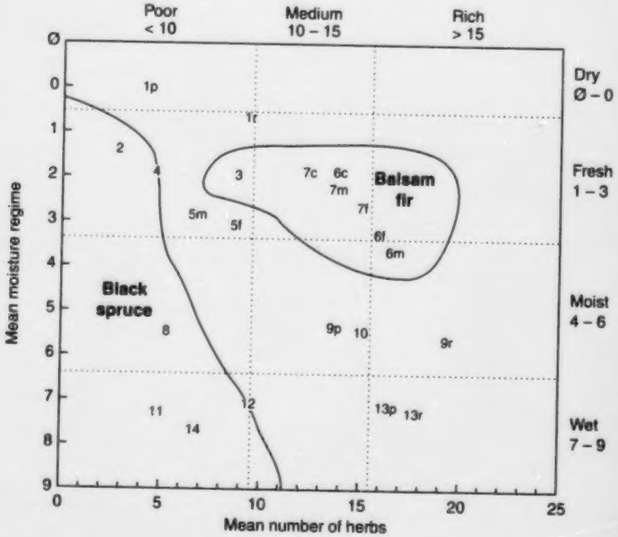
...Forest Floor Types

Ecosites 15 to 21



Abundance of Advance Growth

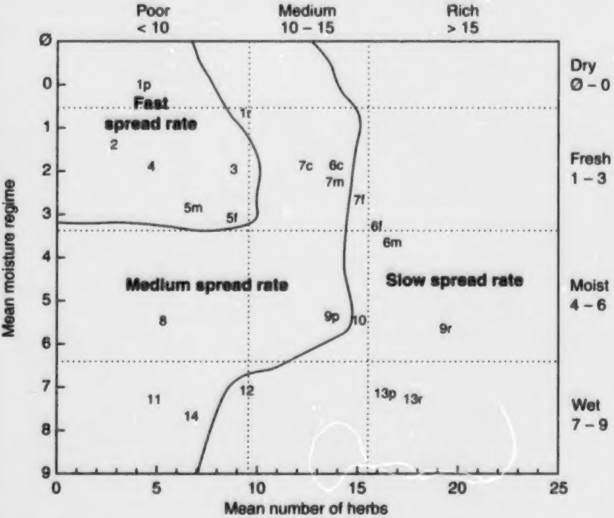
This diagram shows how the abundance of black spruce and balsam fir advance growth is related to ES1 to ES14. The delineated ranges of ecosites had average density levels of advance growth (including all seedlings and saplings up to 10 m in height) greater than 10,000 stems/ha. for black spruce, and greater than 7,500 stems/ha. for balsam fir (Arnup 1996).



Post-harvest Fire Spread Classes

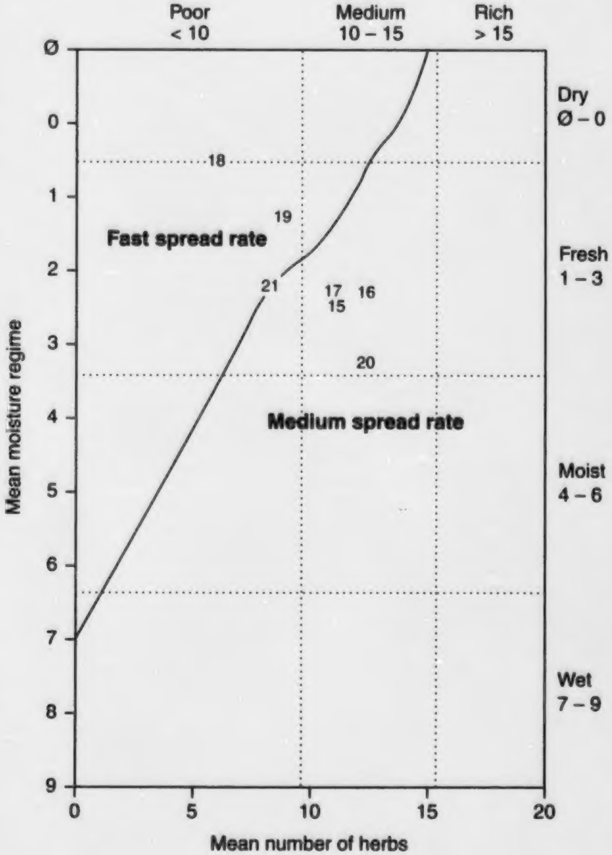
These diagrams group the ecosites into three classes according to the predicted rate of fire spread (fast, medium and slow) following harvesting. The fire spread rates are based on the relative abundance of fire-resistant fuels (e.g. green vegetation), and the range of soil moisture regimes within the ecosite groups. Fast spread rates are associated with dry to fresh, herb and shrub poor upland conifer sites. Medium spread rates are associated with dry to fresh upland sites with medium numbers of shrubs and herbs, and with moist to wet, herb and shrub poor lowland sites. Slow spread rates are associated with fresh to moist, herb and shrub rich mixedwood upland sites, and with wet, herb and shrub medium to rich lowland sites. Note that the actual rate of fire spread on a particular site will be affected by other factors, such as the harvest method and timing.

Ecosites 1 to 14



...Post-harvest Fire Spread Classes

Ecosites 15 to 21



Appendix A
Plant Species List

Plant Species List
(Latin to Common Names)

Trees

Abies balsamea	Balsam fir
Acer rubrum	Red maple
Acer saccharum ssp. *saccharum*	Sugar maple
Betula alleghaniensis	Yellow birch
Betula papyrifera	White birch
Fraxinus nigra	Black ash
Larix laricina	Larch
Picea glauca	White spruce
Picea mariana	Black spruce
Pinus banksiana	Jack pine
Pinus resinosa	Red pine
Pinus strobus	White pine
Populus balsamifera ssp. *balsamifera*	Balsam poplar
Populus grandidentata	Large tooth aspen
Populus tremuloides	Trembling aspen
Salix spp.	Willows
Thuja occidentalis	White cedar
Ulmus americana	White elm

Shrubs

Acer spicatum	Mountain maple
Alnus incana ssp. *rugosa*	Speckled alder
Alnus viridis ssp. *crispa*	Green alder
Amelanchier spp.	Serviceberries
Andromeda polifolia ssp. *glaucophylla*	Bog rosemary
Betula pumila	Dwarf birch
Chamaedaphne calyculata	Leatherleaf
Cornus canadensis	Bunchberry
Cornus stolonifera	Red osier dogwood
Corylus cornuta ssp. *cornuta*	Beaked hazel
Diervilla lonicera	Bush honeysuckle
Epigaea repens	Trailing arbutus
Gaultheria hispidula	Creeping snowberry
Gaultheria procumbens	Wintergreen
Kalmia angustifolia	Sheep laurel
Kalmia polifolia	Pale laurel
Ledum groenlandicum	Labrador-tea
Linnaea borealis ssp. *longiflora*	Twinflower
Lonicera canadensis	Canada honeysuckle
Lonicera hirsuta	Hairy honeysuckle
Lonicera involucrata	Four-lined honeysuckle
Lonicera spp.	Honeysuckles
Lonicera villosa	Northern honeysuckle
Oxycoccus microcarpus	Small cranberry
Prunus virginiana ssp. *virginiana*	Choke cherry

...Plant Species List (Latin to Common Names)

Rhamnus alnifolia	Alder-leaved buckthorn
Ribes glandulosum	Skunk currant
Ribes lacustre	Bristly black currant
Ribes spp.	Currants and Gooseberries
Ribes triste	Swamp red currant
Rosa acicularis ssp. *sayi*	Bristly wild rose
Rubus idaeus ssp. *melanolasius*	Wild red raspberry
Rubus pubescens	Dwarf raspberry
Salix bebbiana	Bebb's willow
Salix spp.	Willows
Sorbus americana	American mountain ash
Sorbus decora	Showy mountain ash
Sorbus spp.	Mountain ashes
Taxus canadensis	Ground hemlock
Vaccinium angustifolium	Early low blueberry
Vaccinium myrtilloides	Velvetleaf blueberry
Viburnum edule	Squashberry
Herbs	
Actaea rubra	Red baneberry
Actaea spp.	Baneberries
Anemone quinquefolia var. *quinquefolia*	Wood anemone
Aralia nudicaulis	Sarsaparilla
Aster ciliolatus	Ciliolate aster
Aster macrophyllus	Large-leaved aster
Circaea alpina	Smaller enchanter's nightshade
Clintonia borealis	Blue bead lily
Coptis trifolia	Goldthread
Epilobium angustifolium	Fireweed
Fragaria virginiana ssp. *virginiana*	Wild strawberry
Galium triflorum	Fragrant bedstraw
Geocaulon lividum	Northern comandra
Goodyera repens	Dwarf rattlesnake plantain
Maianthemum canadense	Wild lily-of-the-valley
Maianthemum trifolium	Three-leaved smilacina
Mertensia paniculata	Bluebells/Northern bluebells
Mitella nuda	Naked mitrewort
Monotropa uniflora	Indian pipe
Oxalis acetosella ssp. *montana*	True wood-sorrel
Oxalis stricta	Upright yellow wood-sorrel
Petasites frigidus var. *palmatus*	Sweet coltsfoot
Pyrola spp.	
Solidago rugosa ssp. *rugosa*	Rough goldenrod
Streptopus amplexifolius	White mandarin
Streptopus roseus	Rose twisted-stalk

Trientalis borealis	Starflower
Trillium cernuum	Nodding trillium
Viola renifolia	Kidney-leaved violet
Viola spp.	Violets
Ferns	
Athyrium filix-femina ssp. *angustum*	Northern lady fern
Botrychium virginianum	Rattlesnake fern
Dryopteris carthusiana	Spinulose shield fern
Gymnocarpium dryopteris	Oak fern
Pteridium aquilinum var. *latiusculum*	Bracken fern
Horsetails	
Equisetum arvense	Field horsetail
Equisetum sylvaticum	Woodland horsetail
Clubmosses	
Huperzia lucidula	Shining clubmoss
Lycopodium annotinum	Interrupted clubmoss
Lycopodium clavatum	Wolf's claw clubmoss
Lycopodium obscurum	Ground pine
Lycopodium spp.	Clubmosses
Grasses and Sedges	
Calamagrostis canadensis	Canada blue-joint
Carex spp.	Sedges
Cinna latifolia	Broad-leaved reed grass
Oryzopsis asperifolia	Mountain rice grass
Mosses and Liverworts	
Bazzania trilobata	Three-lobed bazzania
Brachythecium spp.	
Calliergon spp.	
Climacium dendroides	Northern tree moss
Dicranum flagellare	Spiky dicranum
Dicranum fuscescens var. *fuscescens*	Curly heron's-bill moss
Dicranum montanum	Lawn moss
Dicranum polysetum	Wavy-leaved moss
Dicranum scoparium	Broom moss
Hylocomium splendens	Stair-step moss
Hypnum pallescens var. *pallescens*	Stump pigtail moss
Jamesoniella autumnalis var. *autumnalis*	Jameson's liverwort
Mnium cuspidatum	
Mnium pseudopunctatum	

...Plant Species List (Latin to Common Names)

Mnium spp.	
Plagiothecium laetum	Glossy moss
Plagiothecium spp.	
Pleurozium schreberi	Schreber's moss
Polytrichum commune var. *commune*	Common hair cap moss
Polytrichum juniperinum	Juniper hair cap moss
Ptilidium ciliare	Northern naugehyde liverwort
Ptilidium pulcherrimum	Naugehyde liverwort
Ptilium crista-castrensis	Plume moss
Rhytidiadelphus triquetrus	Electrified cat-tail moss
Sanionia uncinata	Sickle moss
Sphagnum angustifolium	(Yellow two-leaved peat moss)
Sphagnum capillifolium	(Lady's tresses peat moss)
Sphagnum fuscum	(Brown bog peat moss)
Sphagnum girgensohnii	(Common green peat moss)
Sphagnum magellanicum	(Red fat-leaved peat moss)
Sphagnum wulfianum	Wulf's peat moss
Tetraphis pellucida	Common four-tooth moss
Thuidium delicatulum	Common fern moss
Tomenthypnum nitens	Ribbed bog moss

Lichens

Cladina mitis	Yellow-green lichen
Cladina rangiferina	Reindeer lichen
Cladina stellaris var. *stellaris*	Coral lichen
Cladonia chlorophaea	False pixie cup lichen
Cladonia coniocraea	Powder horn lichen
Cladonia cristatella	British soldiers

* Names in brackets are translated from Finnish and may be useful as memory aids.

Plant Species List
(Common to Latin Names)

Trees

Balsam fir	*Abies balsamea*
Balsam poplar	*Populus balsamifera* ssp. *balsamifera*
Black ash	*Fraxinus nigra*
Black spruce	*Picea mariana*
Jack pine	*Pinus banksiana*
Larch	*Larix laricina*
Large tooth aspen	*Populus grandidentata*
Red maple	*Acer rubrum*
Red pine	*Pinus resinosa*
Sugar maple	*Acer saccharum* ssp. *saccharum*
Trembling aspen	*Populus tremuloides*
White birch	*Betula papyrifera*
White cedar	*Thuja occidentalis*
White elm	*Ulmus americana*
White pine	*Pinus strobus*
White spruce	*Picea glauca*
Willows	*Salix* spp.
Yellow birch	*Betula alleghaniensis*

Shrubs

Alder-leaved buckthorn	*Rhamnus alnifolia*
American mountain ash	*Sorbus americana*
Beaked hazel	*Corylus cornuta* ssp. *cornuta*
Bebb's willow	*Salix bebbiana*
Bog rosemary	*Andromeda polifolia* ssp. *glaucophylla*
Bristly black currant	*Ribes lacustre*
Bristly wild rose	*Rosa acicularis* ssp. *sayi*
Bunchberry	*Cornus canadensis*
Bush honeysuckle	*Diervilla lonicera*
Canada honeysuckle	*Lonicera canadensis*
Choke cherry	*Prunus virginiana* ssp. *virginiana*
Creeping snowberry	*Gaultheria hispidula*
Currants and Gooseberries	*Ribes* spp.
Dwarf birch	*Betula pumila*
Dwarf raspberry	*Rubus pubescens*
Early low blueberry	*Vaccinium angustifolium*
Four-lined honeysuckle	*Lonicera involucrata*
Green alder	*Alnus viridis* ssp. *crispa*
Ground hemlock	*Taxus canadensis*
Hairy honeysuckle	*Lonicera hirsuta*
Honeysuckles	*Lonicera* spp.
Labrador-tea	*Ledum groenlandicum*
Leatherleaf	*Chamaedaphne calyculata*
Mountain ashes	*Sorbus* spp.

...Plant Species List
(Common to Latin Names)

Mountain maple	*Acer spicatum*
Northern honeysuckle	*Lonicera villosa*
Pale laurel	*Kalmia polifolia*
Red osier dogwood	*Cornus stolonifera*
Serviceberries	*Amelanchier* spp.
Sheep laurel	*Kalmia angustifolia*
Showy mountain ash	*Sorbus decora*
Skunk currant	*Ribes glandulosum*
Small cranberry	*Oxycoccus microcarpus*
Speckled alder	*Alnus incana* ssp. *rugosa*
Squashberry	*Viburnum edule*
Swamp red currant	*Ribes triste*
Trailing arbutus	*Epigaea repens*
Twinflower	*Linnaea borealis* ssp. *longiflora*
Velvetleaf blueberry	*Vaccinium myrtilloides*
Wild red raspberry	*Rubus idaeus* ssp. *melanolasius*
Willows	*Salix* spp.
Wintergreen	*Gaultheria procumbens*

Herbs

Baneberries	*Actaea* spp.
Blue bead lily	*Clintonia borealis*
Bluebells/Northern bluebells	*Mertensia paniculata*
Ciliolate aster	*Aster ciliolatus*
Dwarf rattlesnake plantain	*Goodyera repens*
Fireweed	*Epilobium angustifolium*
Fragrant bedstraw	*Galium triflorum*
Goldthread	*Coptis trifolia*
Indian pipe	*Monotropa uniflora*
Kidney-leaved violet	*Viola renifolia*
Large-leaved aster	*Aster macrophyllus*
Naked mitrewort	*Mitella nuda*
Nodding trillium	*Trillium cernuum*
Northern comandra	*Geocaulon lividum*
Red baneberry	*Actaea rubra*
Rose twisted-stalk	*Streptopus roseus*
Rough goldenrod	*Solidago rugosa* ssp. *rugosa*
Sarsaparilla	*Aralia nudicaulis*
Smaller enchanter's nightshade	*Circaea alpina*
Starflower	*Trientalis borealis*
Sweet coltsfoot	*Petasites frigidus* var. *palmatus*
Three-leaved smilacina	*Maianthemum trifolium*
True wood-sorrel	*Oxalis acetosella* ssp. *montana*
Upright yellow wood-sorrel	*Oxalis stricta*
Violets	*Viola* spp.
White mandarin	*Streptopus amplexifolius*

...Plant Species List
(Common to Latin Names)

Wild lily-of-the-valley	*Maianthemum canadense*
Wild strawberry	*Fragaria virginiana* ssp. *virginiana*
Wood anemone	*Anemone quinquefolia* var. *quinquefolia*
Ferns	
Bracken fern	*Pteridium aquilinum* var. *latiusculum*
Northern lady fern	*Athyrium filix-femina* ssp. *angustum*
Oak fern	*Gymnocarpium dryopteris*
Rattlesnake fern	*Botrychium virginianum*
Spinulose shield fern	*Dryopteris carthusiana*
Horsetails	
Field horsetail	*Equisetum arvense*
Woodland horsetail	*Equisetum sylvaticum*
Clubmosses	
Clubmosses	*Lycopodium* spp.
Ground pine	*Lycopodium obscurum*
Interrupted clubmoss	*Lycopodium annotinum*
Shining clubmoss	*Huperzia lucidula*
Wolf's claw clubmoss	*Lycopodium clavatum*
Grasses and Sedges	
Broad-leaved reed grass	*Cinna latifolia*
Canada blue-joint	*Calamagrostis canadensis*
Mountain rice grass	*Oryzopsis asperifolia*
Sedges	*Carex* spp.
Mosses and Liverworts	
	Brachythecium spp.
Broom moss	*Dicranum scoparium*
(Brown bog peat moss)	*Sphagnum fuscum*
	Calliergon spp.
Common fern moss	*Thuidium delicatulum*
Common four-tooth moss	*Tetraphis pellucida*
(Common green peat moss)	*Sphagnum girgensohnii*
Common hair cap moss	*Polytrichum commune* var. *commune*
Curly heron's-bill moss	*Dicranum fuscescens* var. *fuscescens*
Electrified cat-tail moss	*Rhytidiadelphus triquetrus*
Glossy moss	*Plagiothecium laetum*
Jameson's liverwort	*Jamesoniella autumnalis* var. *autumnalis*
Juniper hair cap moss	*Polytrichum juniperinum*
(Lady's tresses peat moss)	*Sphagnum capillifolium*
Lawn moss	*Dicranum montanum*
	Mnium cuspidatum
	Mnium pseudopunctatum

...Plant Species List
(Common to Latin Names)

	Mnium spp.
Naugehyde liverwort	*Ptilidium pulcherrimum*
Northern naugehyde liverwort	*Ptilidium ciliare*
Northern tree moss	*Climacium dendroides*
	Plagiothecium spp.
Plume moss	*Ptilium crista-castrensis*
(Red fat-leaved peat moss)	*Sphagnum magellanicum*
Ribbed bog moss	*Tomenthypnum nitens*
Schreber's moss	*Pleurozium schreberi*
Sickle moss	*Sanionia uncinata*
Spiky dicranum	*Dicranum flagellare*
Stair-step moss	*Hylocomium splendens*
Stump pigtail moss	*Hypnum pallescens* var. *pallescens*
Three-lobed bazzania	*Bazzania trilobata*
Wavy-leaved moss	*Dicranum polysetum*
Wulf's peat moss	*Sphagnum wulfianum*
(Yellow two-leaved peat moss)	*Sphagnum angustifolium*
Lichens	
British soldiers	*Cladonia cristatella*
Coral lichen	*Cladina stellaris* var. *stellaris*
False pixie cup lichen	*Cladonia chlorophaea*
Powder horn lichen	*Cladonia coniocraea*
Reindeer lichen	*Cladina rangiferina*
Yellow-green lichen	*Cladina mitis*

* Names in brackets are translated from Finnish and may be useful as memory aids.

Plant Species List
(Latin to French Names)

Trees

Abies balsamea	Sapin baumier
Acer rubrum	Érable rouge
Acer saccharum ssp. *saccharum*	Érable à sucre
Betula alleghaniensis	Bouleau jaune (Betula lutea)
Betula papyrifera	Bouleau à papier
Fraxinus nigra	Frêne noir
Larix laricina	Mélèze laricin
Picea glauca	Épinette blanche
Picea mariana	Épinette noire
Pinus banksiana	Pin gris
Pinus resinosa	Pin rouge
Pinus strobus	Pin blanc
Populus balsamifera ssp. *balsamifera*	Peuplier baumier
Populus grandidentata	Peuplier à grandes dents
Populus tremuloides	Peuplier faux-tremble
Salix spp.	Saule
Thuja occidentalis	Thuya occidental
Ulmus americana	Orme blanc

Shrubs

Acer spicatum	Érable à épis
Alnus incana spp. *rugosa*	Aulne rugueux
Alnus viridis spp. *crispa*	Aulne crispé
Amelanchier spp.	Amélanchier (Petites poires)
Andromeda polifolia ssp. *glaucophylla*	Andromède glauque
Betula pumila	Bouleau nain
Chamaedaphne calyculata	Cassandre caliculé
Cornus canadensis	Cornouiller du Canada
Cornus stolonifera	Cornouiller stolonifère
Corylus cornuta ssp. *cornuta*	Noisetier à long bec
Diervilla lonicera	Dièreville chèvrefeuille
Epigaea repens	Épigée rampante
Gaultheria hispidula	Gaulthérie hispide
Gaultheria procumbins	Gaulthérie couchée (Thé des bois)
Kalmia angustifolia	Kalmia à feuilles étroites (Crevard de moutons)
Kalmia polifolia	Kalmia à feuilles d'Andromède
Ledum groenlandicum	Lédon du Groënland
Linnaea borealis ssp. *longiflora*	Linnée boréale
Lonicera canadensis	Chèvrefeuille du Canada
Lonicera hirsuta	Chèvrefeuille hirsute
Lonicera involucrata	Chèvrefeuille involucré
Lonicera spp.	Chèvrefeuille
Lonicera villosa	Chèvrefeuille velu
Oxycoccus microcarpus	Airelle canneberge

...Plant Species List (Latin to French Names)

Prunus virginiana ssp. *virginiana*	Cerisier de Pennsylvanie
Rhamnus alnifolia	Nerprun à feuilles
Ribes glandulosum	Gadellier glanduleux
Ribes lacustre	Gadellier lacustre
Ribes spp.	Gadellier
Ribes triste	Gadellier amer
Rosa acicularis spp. *sayi*	Rosier aciculaire
Rubus idaeus ssp. *melanolasius*	Ronce du Mont Ida
Rubus pubescens	Ronce pubescente
Salix bebbiana	Saule de Bebb
Salix spp.	Saule
Sorbus americana	Sorbier d'Amérique
Sorbus decora	Sorbier des montagnes
Sorbus spp.	Sorbier
Taxus canadensis	If du Canada
Vaccinium angustifolium	Airelle à feuilles étroites (Bleuets)
Vaccinium myrtilloides	Airelle fausse-Myrtille
Vibernum edule	Viorne comestible

Herbs

Actaea rubra	Actée rouge
Actaea spp.	Actée
Anemone quinquefolia var. *quinquefolia*	Anémone à cinq folioles
Aralia nudicaulis	Aralie à tige nue
Aster ciliolatus	Aster ciliolé
Aster macrophyllus	Aster à grandes feuilles
Circaea alpina	Circée alpine
Clintonia borealis	Clintonie boréale
Coptis trifolia	Coptide du Groënland
Epilobium angustifolium	Épilobe à feuilles étroites (Bouquets rouges)
Fragaria virginiana ssp. *virginiana*	Fraisier de Virginie
Galium triflorum	Gaillet à trois fleurs
Geocaulon lividum	Commandre livide
Goodyera repens	Goodyérie pubescente
Maianthemum canadense	Maïanthème du Canada
Maianthemum trifolium	Smilacine trifoliée
Mertensia paniculata	Mertensia paniculé
Mitella nuda	Mitrelle nue
Monotropa uniflora	Monotrope uniflora
Oxalis acetosella ssp. *montana*	Petite oxalide
Oxalis stricta	Oxalide d'Europe
Petasites frigidus var. *palmatus*	Pétasite palmé
Pyrola spp.	Pyrole

...Plant Species List
(Latin to French Names)

Solidago rugosa ssp. *rugosa*	
Streptopus amplexifolius	Streptope amplexicaule
Streptopus roseus	Streptope rose
Trientalis borealis	Trientale boréale
Trillium cernuum	Trille penché
Viola renifolia	Violette réniforme
Viola spp.	Violette

Ferns

Athyrium filix-femina ssp. *angustum*	Athyrie fougère-femelle
Botrychium virginianum	Botryche de Virginie
Dryopteris carthusiana	Dryoptéride spinuleuse
Gymnocarpium dryopteris	Dryoptéride disjointe
Pteridium aquilinum var. *latiusculum*	Ptéridium des aigles

Horsetails

Equisetum arvense	Prêle des champs
Equisetum sylvaticum	Prêle des bois

Clubmosses

Huperzia lucidula	Hyperzie brillant
Lycopodium annotinum	Lycopode innovant
Lycopodium clavatum	Lycopode à massue
Lycopodium obscurum	Lycopode foncé
Lycopodium spp.	Lycopode

Grasses and Sedges

Calamagrostis canadensis	Calamagrostis du Canada
Carex spp.	Carex
Cinna latifolia	Cinna à larges feuilles
Oryzopsis asperifolia	Orysopsis à feuilles

Mosses and Liverworts

Bazzania trilobata	Bazzanie trilobée
Brachythecium spp.	
Calliergon spp.	
Climacium dendroides	Climacie arbustive
Dicranum flagellare	
Dicranum fuscescens var. *fuscescens*	Dicrane brunâtre
Dicranum montanum	
Dicranum polysetum	
Dicranum scoparium	Dicrane à balai
Hylocomium splendens	Hypne éclatante
Hypnum pallescens var. *pallescens*	

...Plant Species List (Latin to French Names)

Jamesoniella autumnalis var. *autumnalis*	
Mnium cuspidatum	
Mnium pseudopunctatum	
Mnium spp.	Mnie
Plagiothecium laetum	
Plagiothecium spp.	
Pleurozium schreberi	Hypne de Schreber
Polytrichum commune var. *commune*	Polytric commun
Polytrichum juniperinum	Polytric
Ptilidium ciliare	
Ptilidium pulcherrimum	
Ptilium crista-castrensis	Hypne plumeuse
Rhytidiadelphus triquetrus	Hypne triquètre
Sanionia uncinata	
Sphagnum angustifolium	
Sphagnum capillifolium	
Sphagnum fuscum	Sphaigne brune
Sphagnum girgensohnii	Sphaigne de girgensohn
Sphagnum magellanicum	
Sphagnum wulfianum	
Tetraphis pellucida	
Thuidium delicatulum	Mousse fougère
Tomenthypnum nitens	
Lichens	
Cladina mitis	Cladine douce
Cladina rangiferina	Cladine rangifère
Cladina stellaris var. *stellaris*	Cladine étoilée
Cladonia chlorophaea	
Cladonia coniocraea	
Cladonia cristatella	

Plant Species List
(French to Latin Names)

Trees

Bouleau à papier	*Betula papyrifera*
Bouleau jaune (Betula lutea)	*Betula alleghaniensis*
Épinette blanche	*Picea glauca*
Épinette noire	*Picea mariana*
Érable à sucre	*Acer saccharum* ssp. *saccharum*
Érable rouge	*Acer rubrum*
Frêne noir	*Fraxinus nigra*
Mélèze laricin	*Larix laricina*
Orme blanc	*Ulmus americana*
Peuplier à grandes dents	*Populus grandidentata*
Peuplier baumier	*Populus balsamifera* ssp. *balsamifera*
Peuplier faux-tremble	*Populus tremuloides*
Pin blanc	*Pinus strobus*
Pin gris	*Pinus banksiana*
Pin rouge	*Pinus resinosa*
Sapin baumier	*Abies balsamea*
Saule	*Salix* spp.
Thuya occidental	*Thuja occidentalis*

Shrubs

Airelle à feuilles étroites (bleuets)	*Vaccinium angustifolium*
Airelle canneberge	*Oxycoccus microcarpus*
Airelle fausse-Myrtille	*Vaccinium myrtilloides*
Amélanchier (Petites poires)	*Amelanchier* spp.
Andromède glauque	*Andromeda polifolia* ssp. glaucophylla
Aulne crispé	*Alnus viridis* spp. *crispa*
Aulne rugueux	*Alnus incana* spp. *rugosa*
Bouleau nain	*Betula pumila*
Cassandre caliculé	*Chamaedaphne calyculata*
Cerisier de Pennsylvanie	*Prunus virginiana* ssp. *virginiana*
Chèvrefeuille	*Lonicera* spp.
Chèvrefeuille du Canada	*Lonicera canadensis*
Chèvrefeuille hirsute	*Lonicera hirsuta*
Chèvrefeuille involucré	*Lonicera involucrata*
Chèvrefeuille velu	*Lonicera villosa*
Cornouiller du Canada	*Cornus canadensis*
Cornouiller stolonifère	*Cornus stolonifera*
Dièreville chèvrefeuille	*Diervilla lonicera*
Épigée rampante	*Epigaea repens*
Érable à épis	*Acer spicatum*
Gadellier	*Ribes* spp.
Gadellier amer	*Ribes triste*
Gadellier glanduleux	*Ribes glandulosum*

...Plant Species List (French to Latin Names)

Gadellier lacustre	*Ribes lacustre*
Gaulthérie couchée (Thé des bois)	*Gaultheria procumbins*
Gaulthérie hispide	*Gaultheria hispidula*
If du Canada	*Taxus canadensis*
Kalmia à feuilles d'Andromède	*Kalmia polifolia*
Kalmia à feuilles étroites	*Kalmia angustifolia*
Lédon du Groënland	*Ledum groenlandicum*
Linnée boréale	*Linnaea borealis* ssp. *longiflora*
Nerprun à feuilles	*Rhamnus alnifolia*
Noisetier à long bec	*Corylus cornuta* ssp. *cornuta*
Ronce du Mont Ida	*Rubus idaeus* ssp. *melanolasius*
Ronce pubescente	*Rubus pubescens*
Rosier aciculaire	*Rosa acicularis* spp. *sayi*
Saule de Bebb	*Salix bebbiana*
Sorbier	*Sorbus* spp.
Sorbier d'Amérique	*Sorbus americana*
Sorbier des montagnes	*Sorbus decora*
Viorne comestible	*Vibernum edule*

Herbs

Actée	*Actaea* spp.
Actée rouge	*Actaea rubra*
Anémone à cinq folioles	*Anemone quinquefolia* var. *quinquefolia*
Aralie à tige nue	*Aralia nudicaulis*
Aster à grandes feuilles	*Aster macrophyllus*
Aster ciliolé	*Aster ciliolatus*
Circée alpine	*Circaea alpina*
Clintonie boréale	*Clintonia borealis*
Commandre livide	*Geocaulon lividum*
Coptide du Groënland	*Coptis trifolia*
Épilobe à feuilles étroites (Bouquets rouges)	*Epilobium angustifolium*
Fraisier de Virginie	*Fragaria virginiana* ssp. *virginiana*
Gaillet à trois fleurs	*Galium triflorum*
Goodyérie pubescente	*Goodyera repens*
Maïanthème du Canada	*Maianthemum canadense*
Mertensia paniculé	*Mertensia paniculata*
Mitrelle nue	*Mitella nuda*
Monotrope uniflora	*Monotropa uniflora*
Oxalide d'Europe	*Oxalis stricta*
Pétasite palmé	*Petasites frigidus* var. *palmatus*
Petite oxalide	*Oxalis acetosella* ssp. *montana*
Pyrole	*Pyrola* spp.
Smilacine trifoliée	*Maianthemum trifolium*
	Solidago rugosa ssp. *rugosa*
Streptope amplexicaule	*Streptopus amplexifolius*

Streptope rose	*Streptopus roseus*
Trientale boréale	*Trientalis borealis*
Trille penché	*Trillium cernuum*
Violette	*Viola* spp.
Violette réniforme	*Viola renifolia*
Ferns	
Athyrie fougère-femelle	*Athyrium filix-femina* ssp. *angustum*
Botryche de Virginie	*Botrychium virginianum*
Dryoptéride disjointe	*Gymnocarpium dryopteris*
Dryoptéride spinuleuse	*Dryopteris carthusiana*
Ptéridium des aigles	*Pteridium aquilinum* var. *latiusculum*
Horsetails	
Prêle des bois	*Equisetum sylvaticum*
Prêle des champs	*Equisetum arvense*
Clubmosses	
Hyperzie brillant	*Huperzia lucidula*
Lycopode	*Lycopodium* spp.
Lycopode à massue	*Lycopodium clavatum*
Lycopode foncé	*Lycopodium obscurum*
Lycopode innovant	*Lycopodium annotinum*
Grasses and Sedges	
Calamagrostis du Canada	*Calamagrostis canadensis*
Carex	*Carex* spp.
Cinna à larges feuilles	*Cinna latifolia*
Orysopsis à feuilles	*Oryzopsis asperifolia*
Mosses and Liverworts	
Bazzanie trilobée	*Bazzania trilobata*
Climacie arbustive	*Climacium dendroides*
Dicrane à balai	*Dicranum scoparium*
Dicrane brunâtre	*Dicranum fuscescens* var. *fuscescens*
Dicrane rugueux	*Drepanocladus uncinatus*
Hypne de Schreber	*Pleurozium schreberi*
Hypne éclatante	*Hylocomium splendens*
Hypne plumeuse	*Ptilium crista-castrensis*
Hypne triquètre	*Rhytidiadelphus triquetrus*
Mnie	*Mnium* spp.
Mousse fougère	*Thuidium delicatulum*
Polytric	*Polytrichum juniperinum*
Polytric commun	*Polytrichum commune* var. *commune*
Sphaigne brune	*Sphagnum fuscum*
Sphaigne de girgensohn	*Sphagnum girgensohnii*

...Plant Species List
(French to Latin Names)

Lichens	
Cladine douce	*Cladina mitis*
Cladine étoilée	*Cladina stellaris* var. *stellaris*
Cladine rangifère	*Cladina rangiferina*

Appendix B
Ecosite Development

Ecosite Development

Northeastern Ontario ecosites were developed using a combination of multivariate analysis and field testing. Attention was given both to the statistical correctness and the usability of the ecosites for both field typing and for mapping purposes.

The ecosites were developed using data from 1,203 plots. The plot data included detailed information on site, soil and vegetation parameters and was collected from throughout the application area. The same data set was used for the development of the soil types and vegetation types.

The first step in the analysis was an environmental gradient analysis which was done to determine which of the measured environmental variables could be associated with the patterning in the vegetation. To do this, the data was analyzed using the CANOCO analysis package (Ter Braak 1991) to ordinate the vegetation data. The axes scores were then correlated with the environmental variables to determine which of the variables was most strongly correlated with the vegetation pattern. The results of this analyses were almost identical to the results found for the previous version of the Forest Ecosystem for Northeastern Ontario. Correlations were found between the axes scores for the first two axes and species richness and moisture regime. In addition there was strong pattern was associated with soil texture for the first two ordination axes.

The third axis seemed to be related to latitude and longitude. The third axis seemed to be influencing the vegetation pattern of the former ST15 and ST16. These findings were consistent with what was found during the analysis for the previous version of the Northeast Forest Ecosystem Classification. This finding facilitated the ecosites that were created in this version of the FEC being easily related to the site types created during the previous analysis (McCarthy *et al.* 1994).

Examination of the ordination diagrams indicated that the vegetation on the sample plots associated with Great Lakes St. Lawrence species such as red maple, sugar maple and yellow birch were very different from the rest of the data set and should be analyzed separately. The remaining data which dealt with true boreal species assemblages were analyzed through examining the different soil texture and moisture groupings separately.

The pine ecosites were analyzed separately since they do not appear as separate ecosites unless all of the plots with pine data are analyzed separately (otherwise they are diluted by the overall data set and the pine types do not appear). The decision to do this analysis was based on a planning need expressed by the regional planning team.

The second step in the analysis of the ecosites was a combination of ordination analysis to look a the clustering of the data plots to determine statistically robust ecosites, coupled with TWINSPAN analysis (Hill 1979) to create keys. To create ES1 to ES14, the data set was divided up based on its soil characters and then a number of analyses were done to look for new ecosites. All of the data that would have keyed to an old site type was analyzed individually for each site type to see if there was an indication in the ordination diagram that there was more than one ecosite present (more than one cluster in the data). The data from each of the soil groupings was analyzed to see if there was a new cluster in the data. If there was data indicating a new ecosite found in both of these analyses, then a new ecosite was proposed.

This process was also followed with old ST15 and ST16 (now ES15 and ES16), though they were examined as a group based on their species composition. ES17 was created in this part of this analysis as a new cluster was found that was robust enough to indicate a separate sugar maple ecosite.

The pine ES18 to ES21 were created by doing both ordination and TWINSPAN analysis solely on those plots which contained red and white pine.

After the analytical component of the analysis was complete, the ecosites were tested in the field (the pine ecosites were not field tested as they did not exist at the time the testing took place). The field testing involved the running of transects over different landforms in the northeast. Along the transects both the old site type and new ecosite was determined. This allowed us to determine a) if a proposed ecosite existed on the ground b) the spatial extent of the proposed ecosites c) how the old site types and new ecosites compared d) the mappability of the proposed ecosites, and e) the way the ecosites patterned themselves over landforms (used in the landform diagrams).

Those proposed ecosites that did not occur on the landscape, or which patterned themselves in a way that rendered them unmappable, were dropped from the system.

After all of the statistical and field information has been collected and analyzed, expert opinion was used as a final call on whether a ecosite should go forward as part of the system.

Appendix C
Vegetation Type Development

Vegetation Type Development

How the Vegetation Types Were Created

The vegetation types are based on the analysis of 1168 plots, using multivariate data analysis. This analysis used the vegetation data (overstorey and understorey) to determine community groupings of forest species. DECORANA analysis was used to create an ordination of all plots. TWINSPAN analysis was completed at the same time using the same data. The first break in the TWINSPAN analysis showed four major groupings of communities: Poor hardwood mixedwoods, rich hardwood mixedwoods, jack pine/black spruce uplands, and black spruce lowlands. Analysis then focused on each of these groups. TWINSPAN groupings were examined for the robustness of their clusters on the ordination diagram. Robust clusters were determined and the vegetation types created. Once the statistical part of the analysis was complete, expert opinion was used to create the final vegetation types.

The vegetation type analysis is a complete re-analysis. There is no relationship between the old vegetation type numbers and the new vegetation types.

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